ИЮНЬСКАЯ
КОНФЕРЕНЦИЯ
В КАРДИОКЛИНИКЕ

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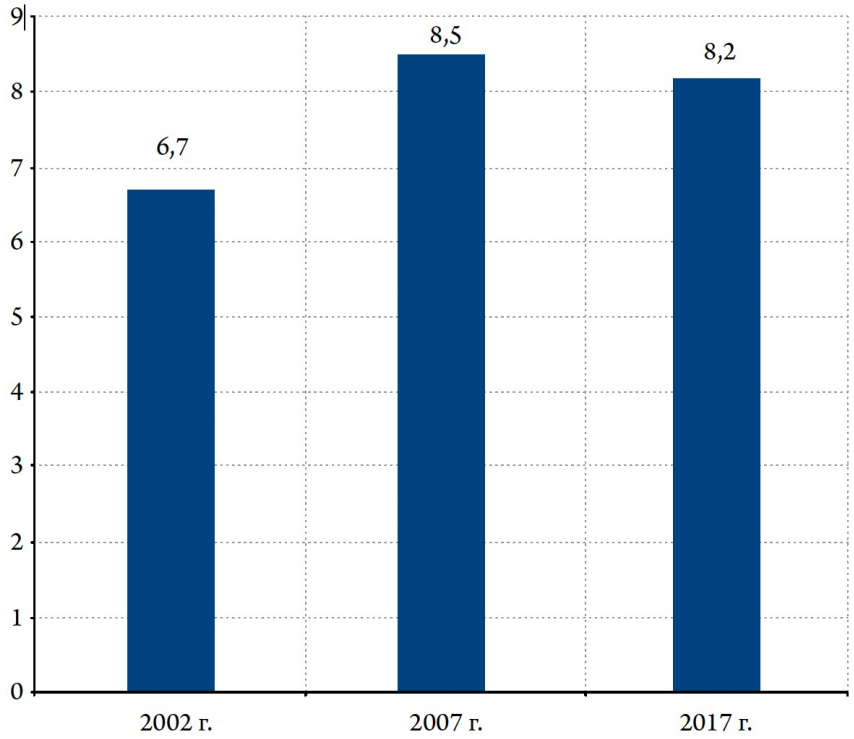
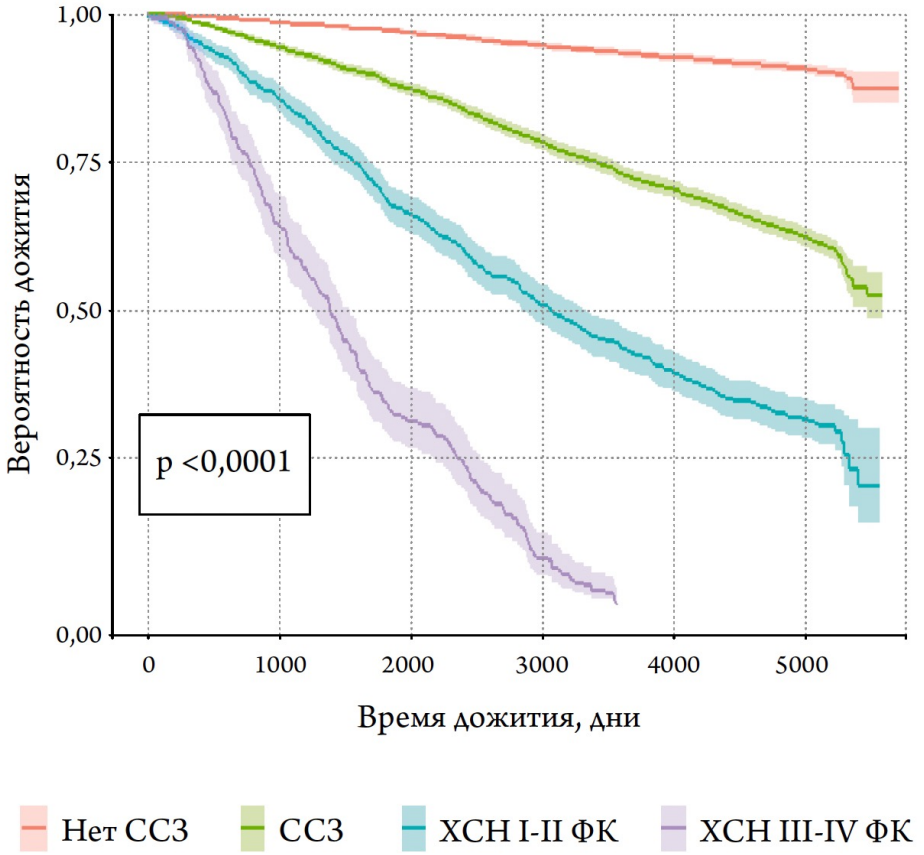
КАРДИОРЕСИНХРОНИЗИРУЮЩАЯ ТЕРАПИЯ И ПРОФИЛАКТИКА ВНЕЗАПНОЙ АРИТМИЧЕСКОЙ СМЕРТИ ПРИ ХСН

Maxim Didenko
Assoc. prof., MD, PhD, FEHRA
Heart and Diabetes Center NRW
University Clinic of the Ruhr University Bochum

Bad Oeynhausen,
Germany

СН В РОССИИ





Кардиология. 2021;61(4):4-14.

СН В ЕВРОПЕЙСКОЙ ЧАСТИ РФ

Хроническая сердечная недостаточность в Российской Федерации: что изменилось за 20 лет наблюдения? Результаты исследования ЭПОХА–ХСН

Показатель	1998 г. (%)	2002 г. (%)*	2002 г. (%)*	2007 г. (%)	2007 г. (%)	2017 г. (%)	2017 г. (%)
I–II ФК	4,3	5,89	-	7,35	-	7,08	-
III–IV ФК	1,8	2,61	2,4	3,45	3,4	3,32	3,1
I–IV ФК	6,1	8,5	6,7	10,8	8,5	10,4	8,2
ССЗ без ХСН	32,8	33,8	–	35,6	–	39,4	–

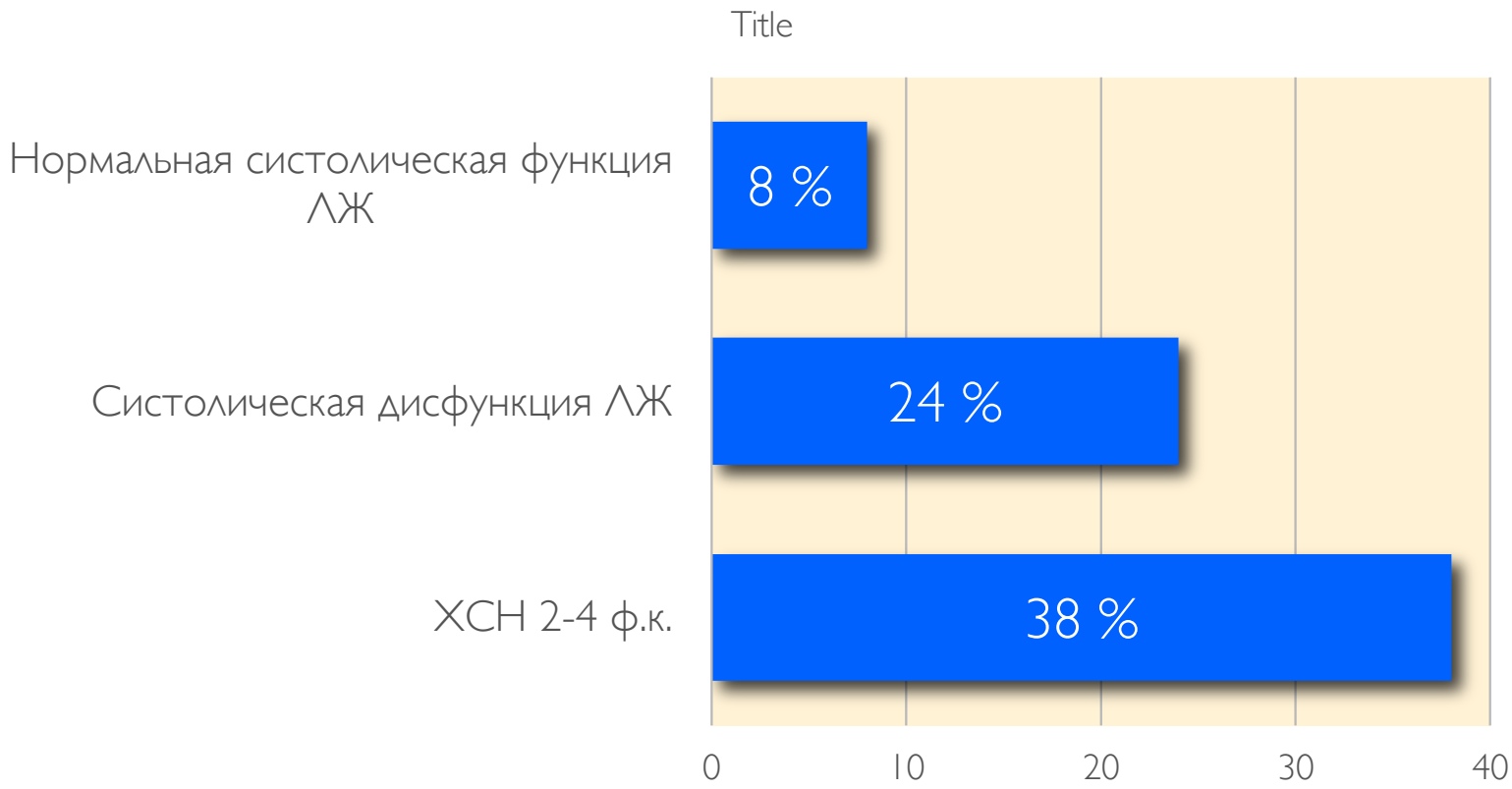
90 млн человек – население Европейской части РФ

~ 6,4 млн – I-IV фк

~ 3 млн – III-IV фк

Кардиология. 2021;61(4):4-14.

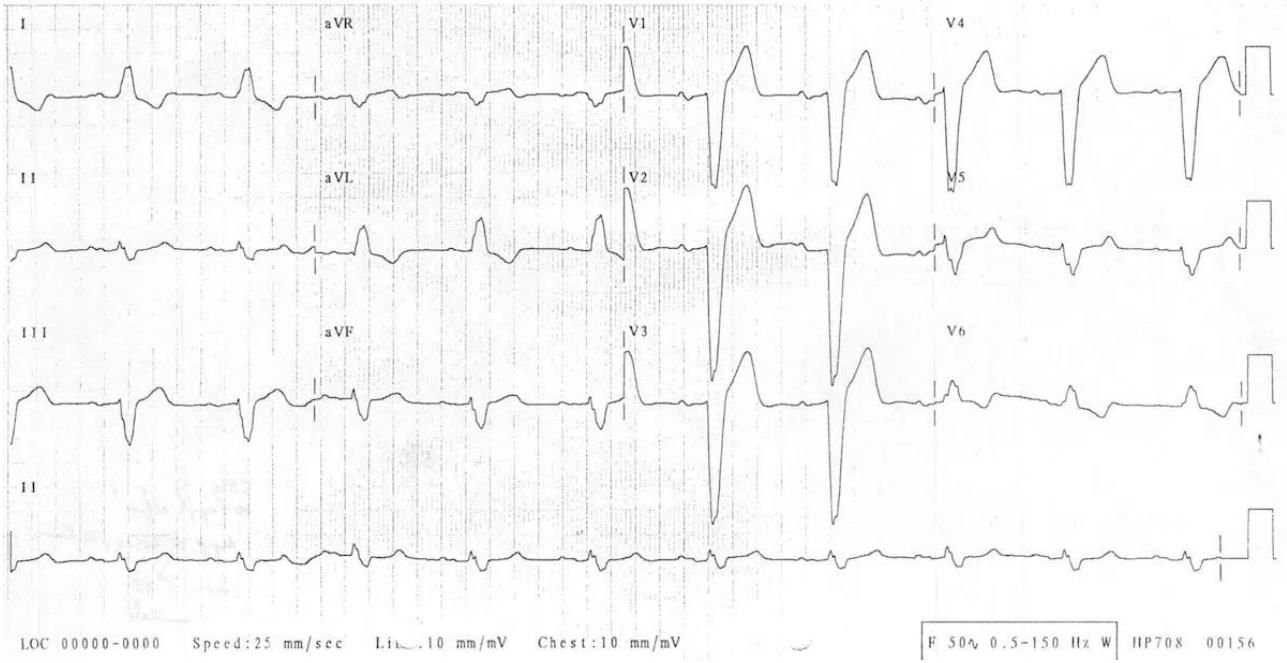
ВСТРЕЧАЕМОСТЬ СЕРДЕЧНОЙ ДИССИНХРОНИИ ПРИ ХСН (%)



Masoudi, et al. JACC 2003;41:217-23; Aaronson, et al. Circ 1997;95:2660-7

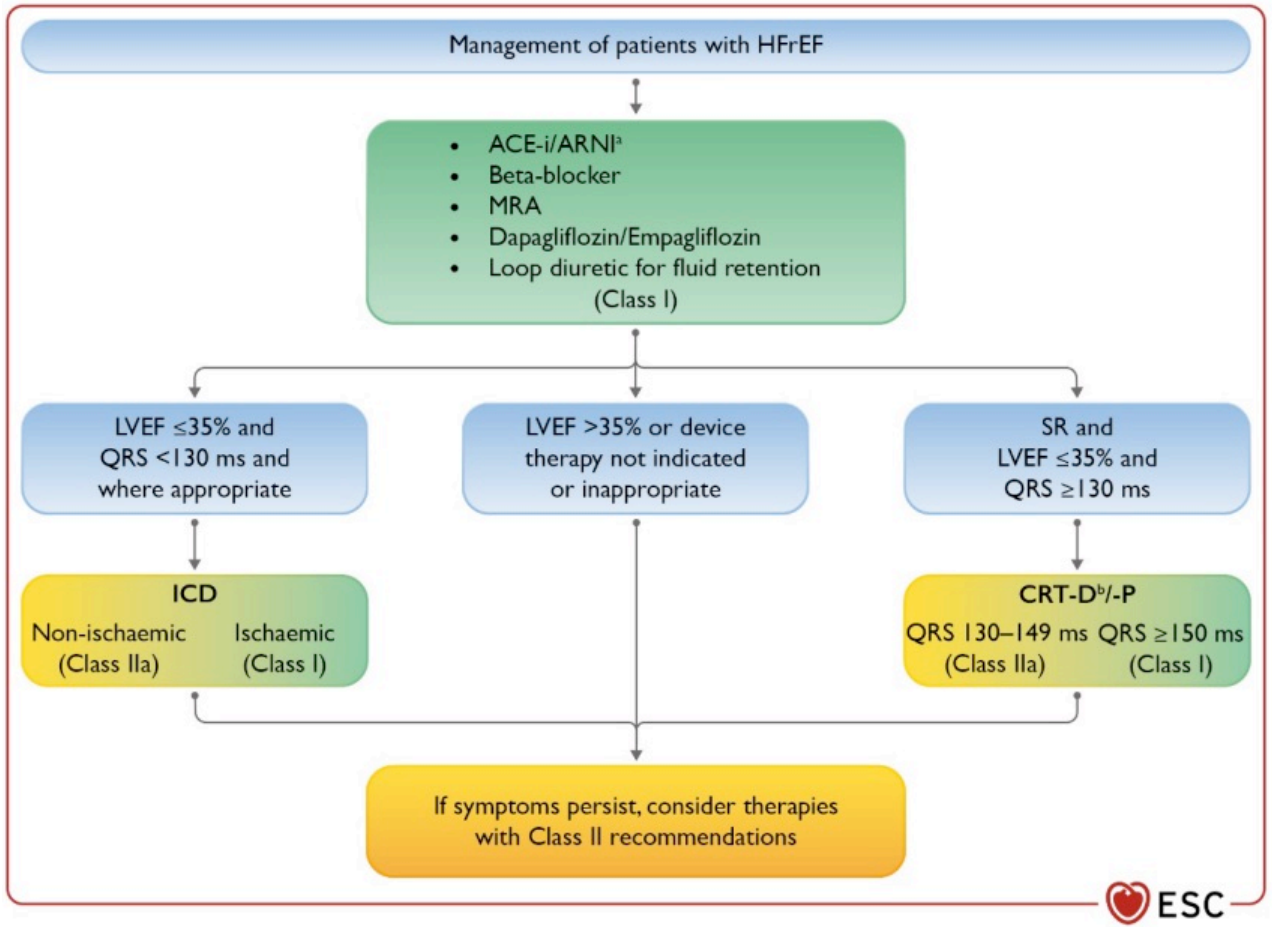
LBBB/ ПБЛНПГ

- QRS duration > 120ms
- Dominant S wave in V1
- Broad monophasic R wave in lateral leads (I, aVL, V5-6)
- Absence of Q waves in lateral leads
- Prolonged R wave peak time > 60ms in leads V5-6



ESC European Society of Cardiology
European Heart Journal (2021) **42**, 3599–3726
doi:10.1093/eurheartj/ehab368

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure



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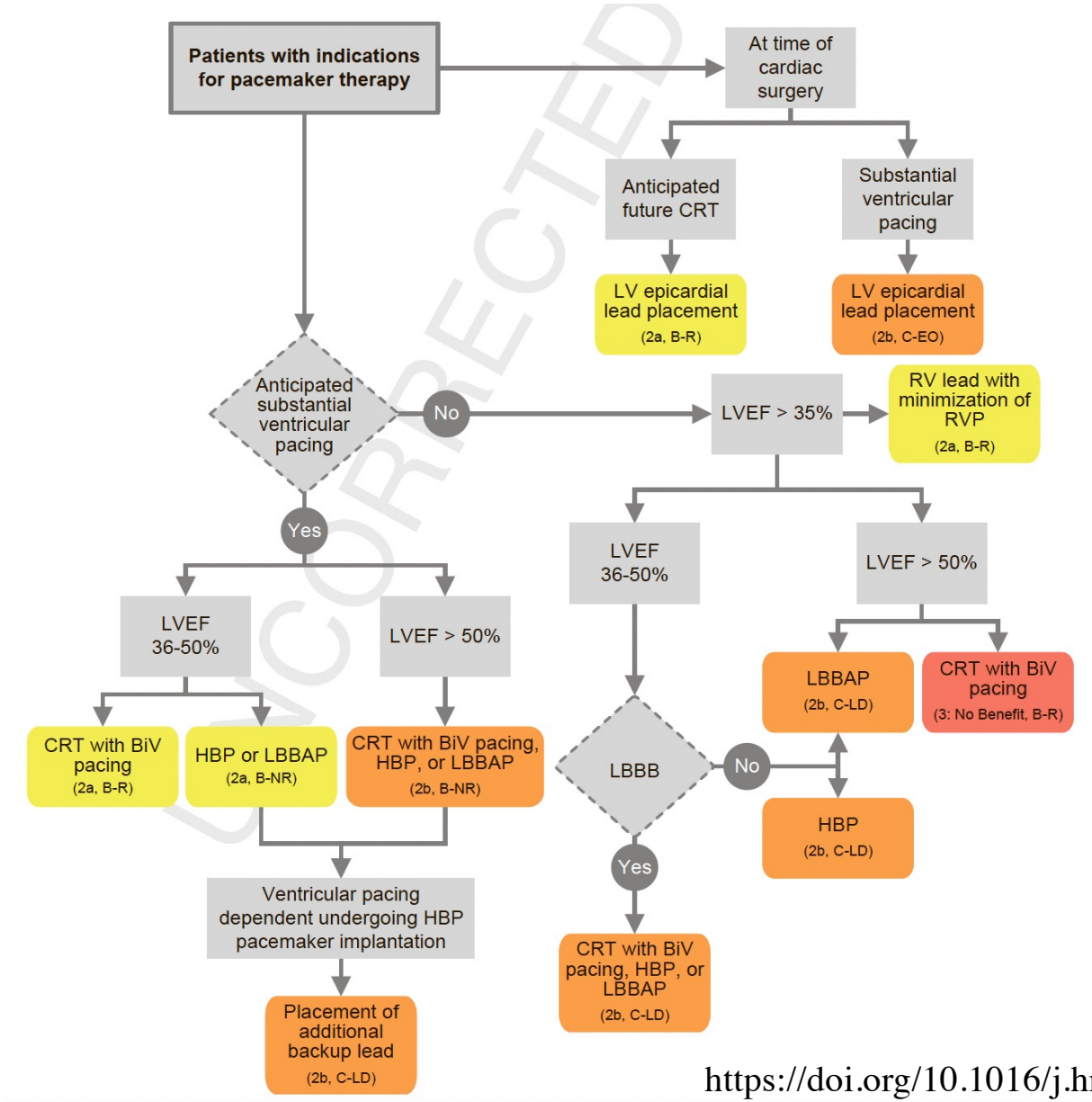
PRACTICE GUIDELINES | ARTICLES IN PRESS

2023 HRS/APHRS/LAHRS guideline on cardiac physiologic pacing for the avoidance and mitigation of heart failure

Mina K. Chung, MD, FHRS * • Kristen K. Patton, MD, FHRS * • Chu-Pak Lau, MD, FHRS, CCDS • ...
Sarah Ann Worsnick, PAC, FHRS, CEPS, CCDS * • Wojciech Zareba, MD, PhD † •
Emily P. Zeitler, MD, MHS, FHRS * • Show all authors • Show footnotes

Open Access • Published: May 20, 2023 • DOI: https://doi.org/10.1016/j.hrthm.2023.03.1538

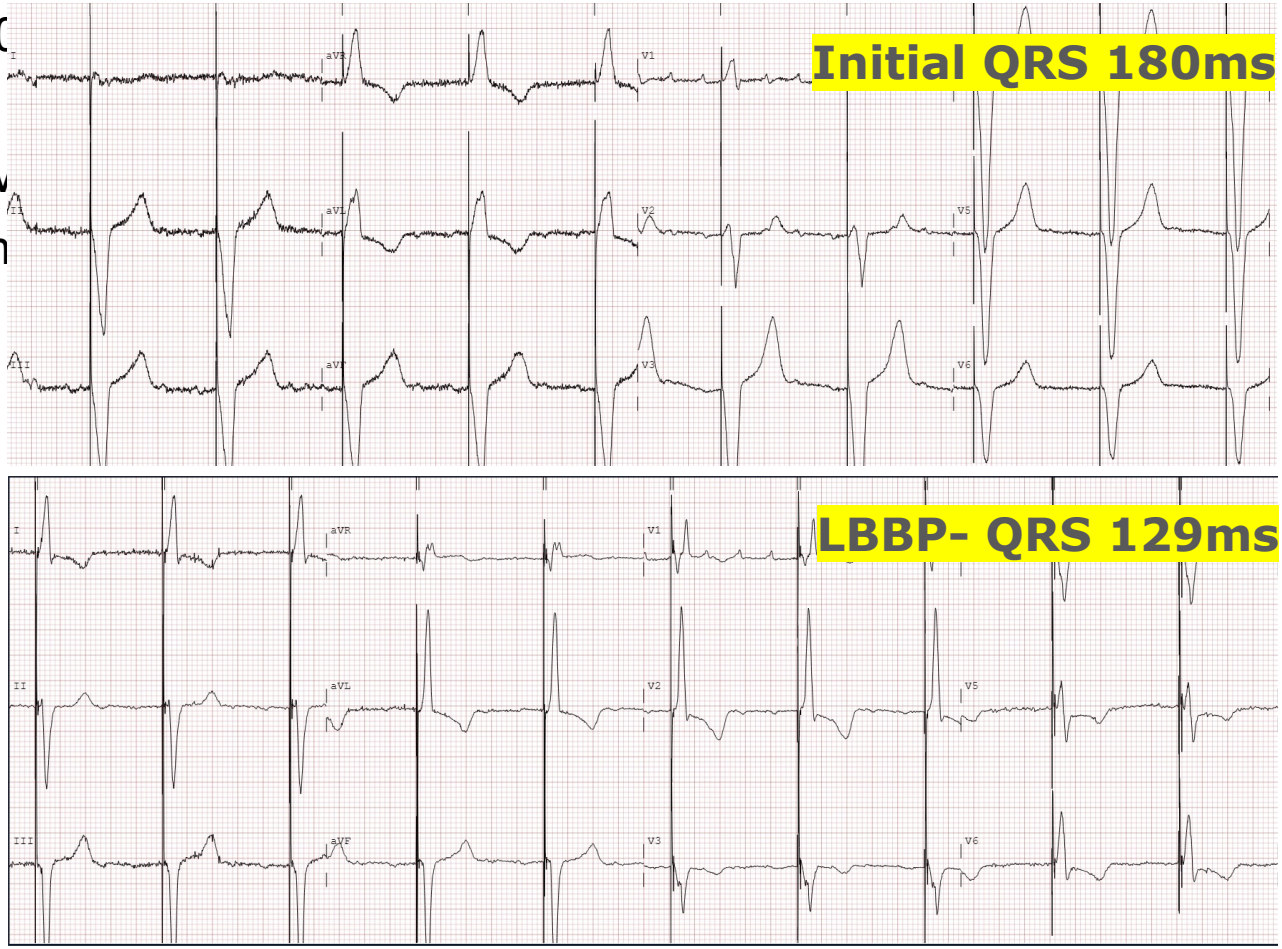
https://doi.org/10.1016/j.hrthm.2023.03.1538

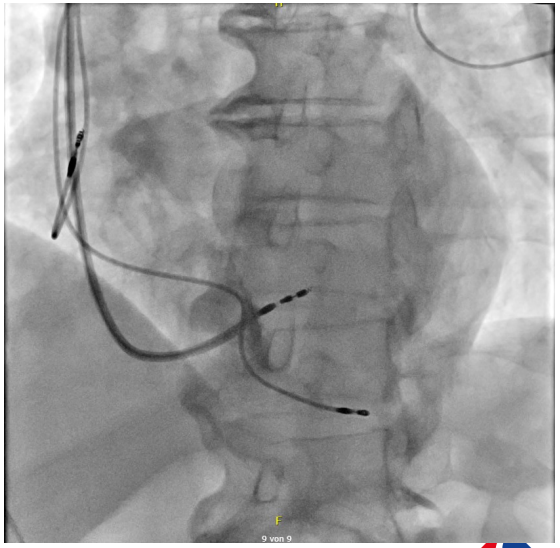


https://doi.org/10.1016/j.hrthm.2023.03.1538

LBB PACING

- 20
- LV
- In





Courtesy by PD. Dr. Guram Imnadze

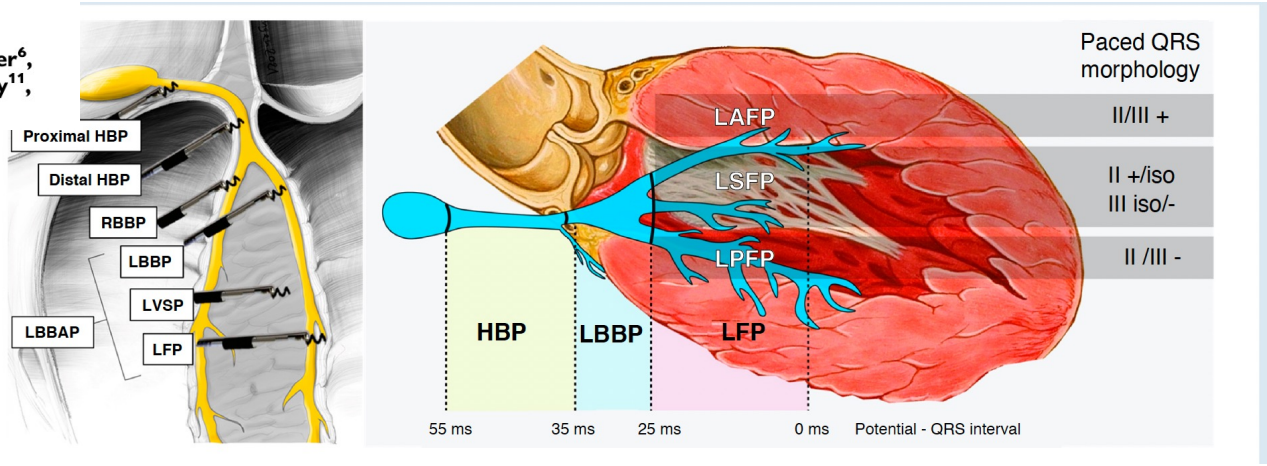
CATEGORIES OF CONDUCTION SYSTEM PACING

ESC European Society of Cardiology
Europace (2023) **25**, 1208–1236
https://doi.org/10.1093/europace/euad043

EHRA DOCUMENT

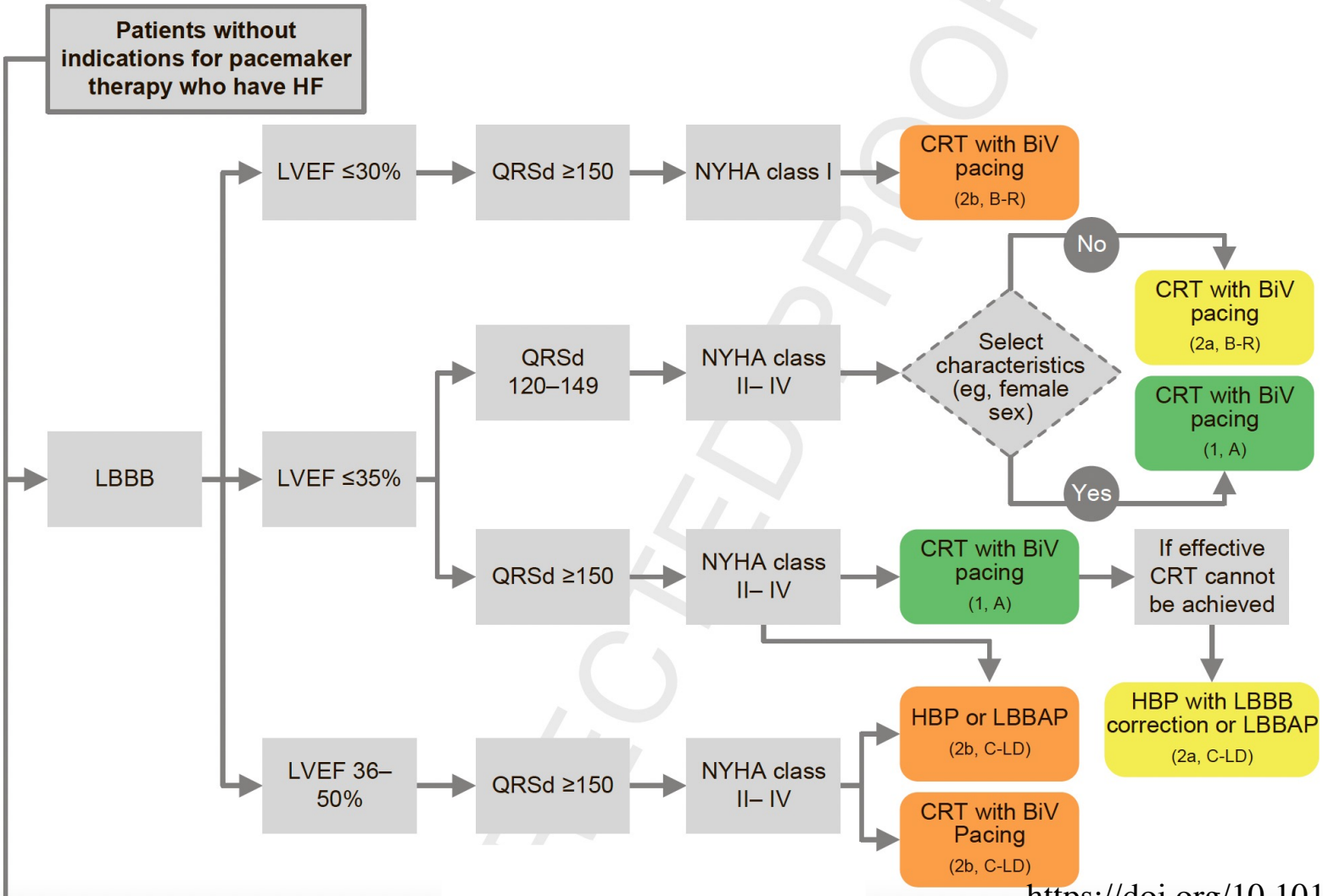
EHRA clinical consensus statement on conduction system pacing implantation: endorsed by the Asia Pacific Heart Rhythm Society (APHRS), Canadian Heart Rhythm Society (CHRS), and Latin American Heart Rhythm Society (LAHRS)

Haran Burri [1]*, Marek Jastrzebski[2], Óscar Cano[3,4], Karol Čurila[5], Jan de Pooter[6], Weijian Huang[7], Carsten Israel[8], Jacqueline Joza[9], Jorge Romero[10], Kevin Vernooy[11], Pugazhendhi Vijayaraman[12], Zachary Whinnett[13], and Francesco Zanon[14]



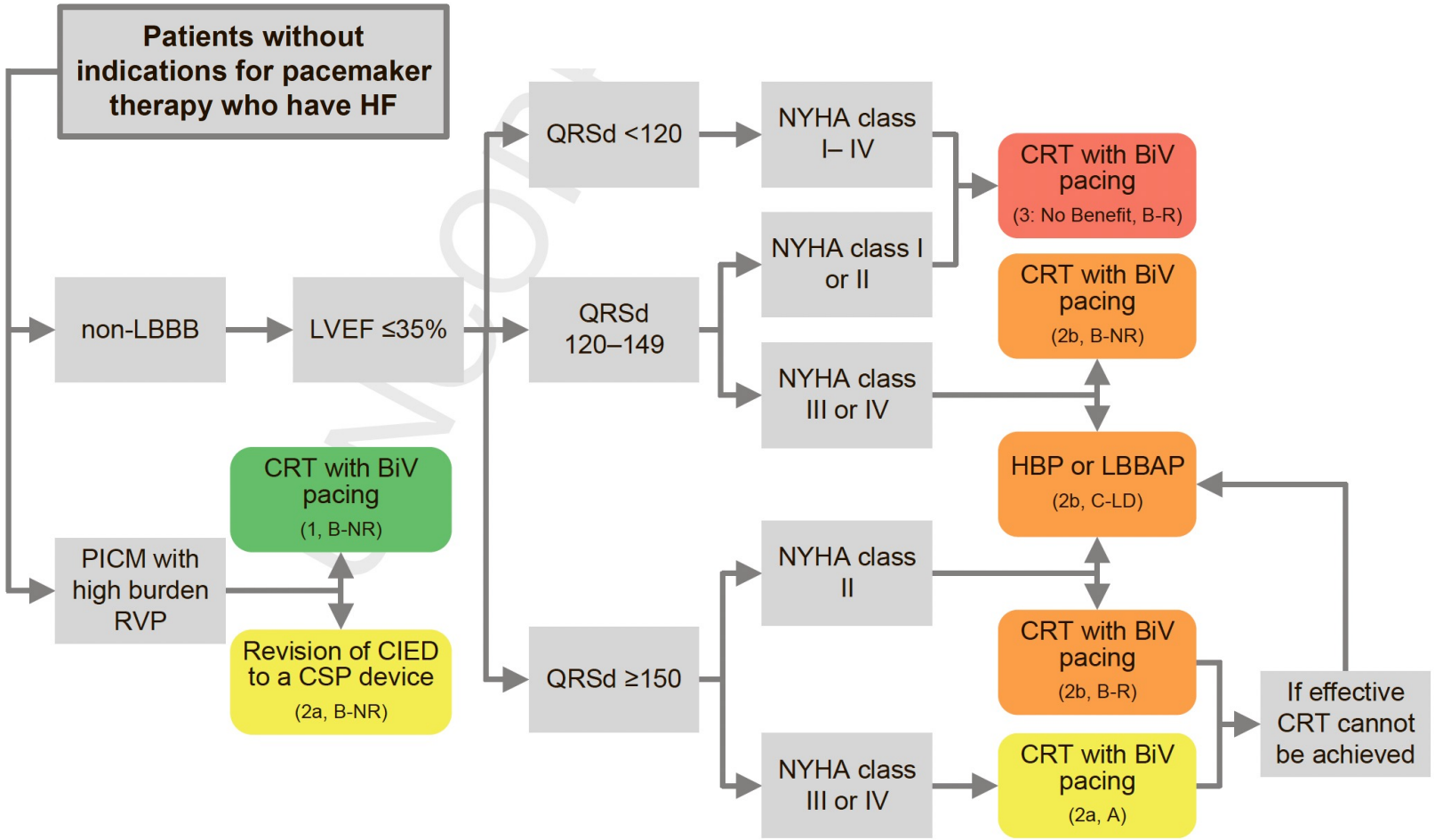
Europace (2023) **25**, 1208–1236
https://doi.org/10.1093/europace/euad043

ПОКАЗАНИЯ К ЭС У ПАЦИЕНТОВ С СН



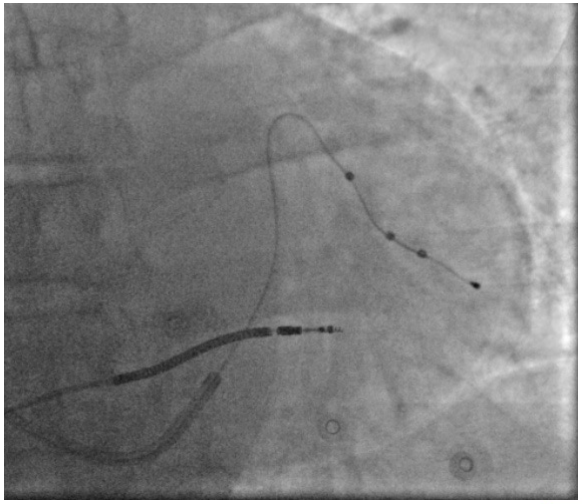
https://doi.org/10.1016/j.hrthm.2023.03.1538

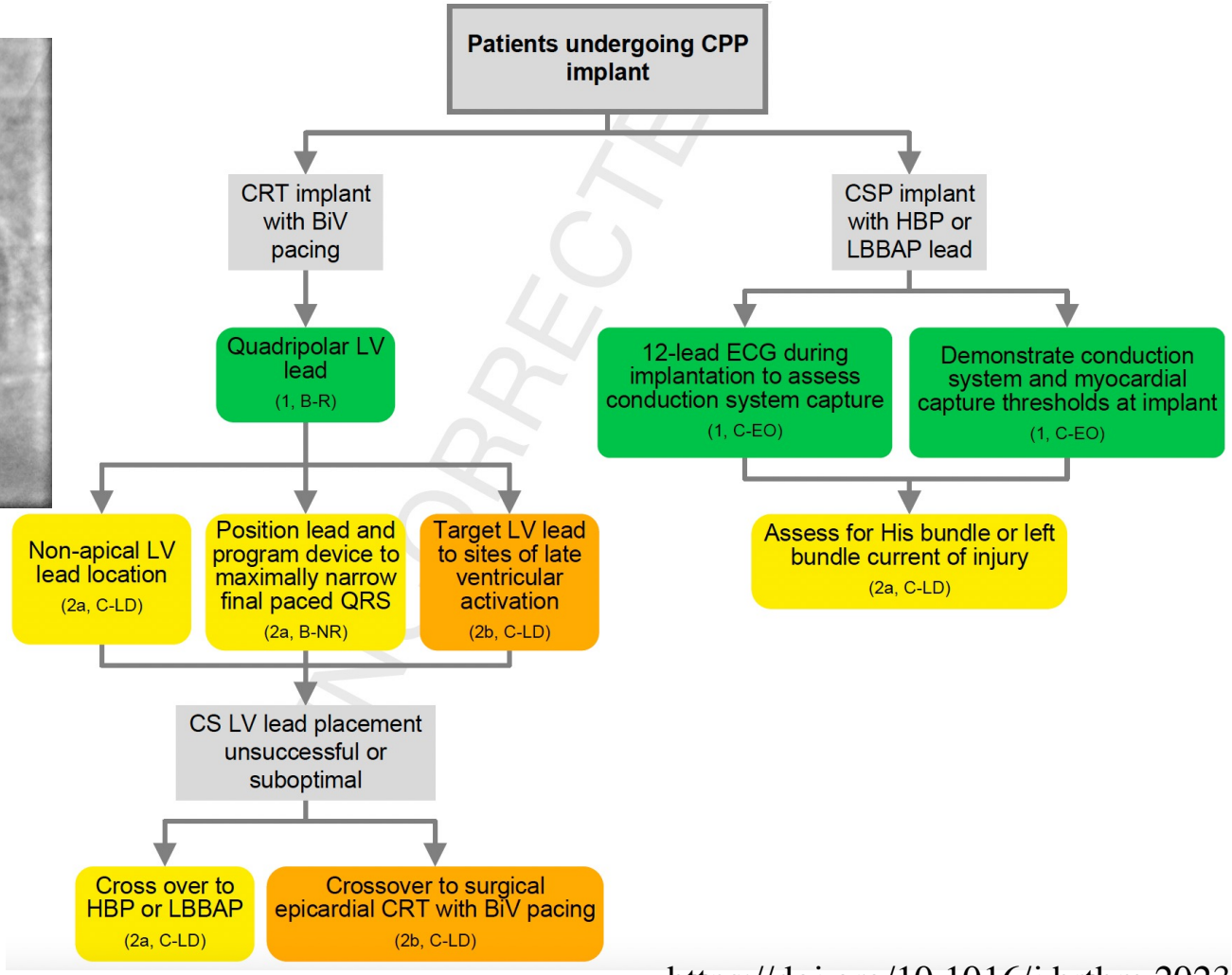
ПОКАЗАНИЯ К ЭС У ПАЦИЕНТОВ С СН



https://doi.org/10.1016/j.hrthm.2023.03.1538

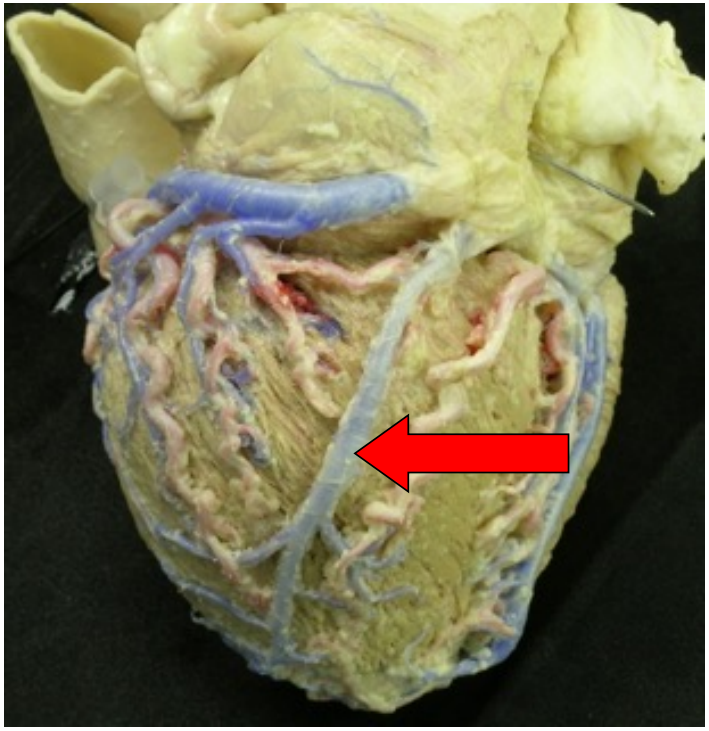
ПРОЦЕДУРА ИМПЛАНТАЦИИ

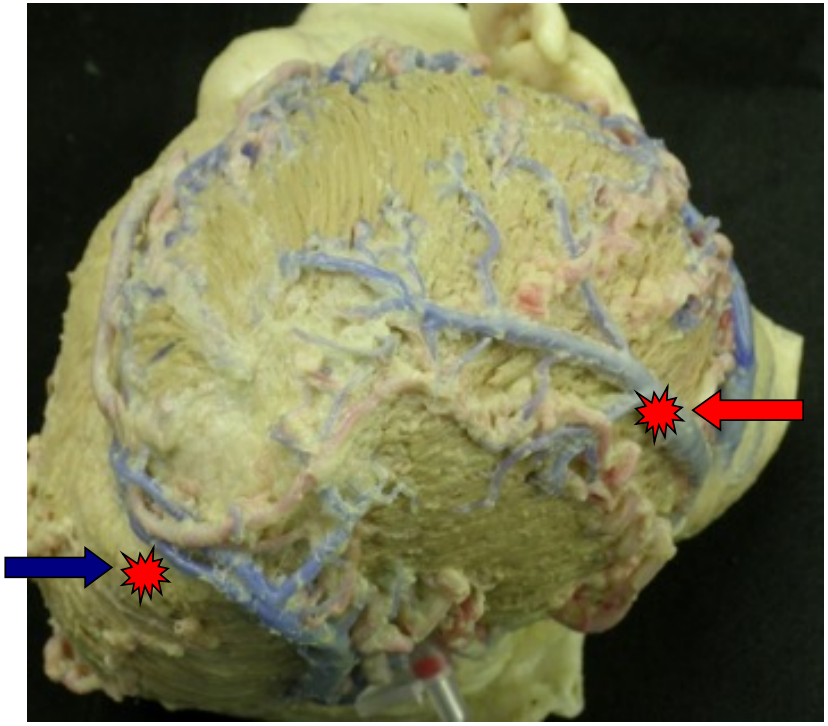




https://doi.org/10.1016/j.hrthm.2023.03.1538

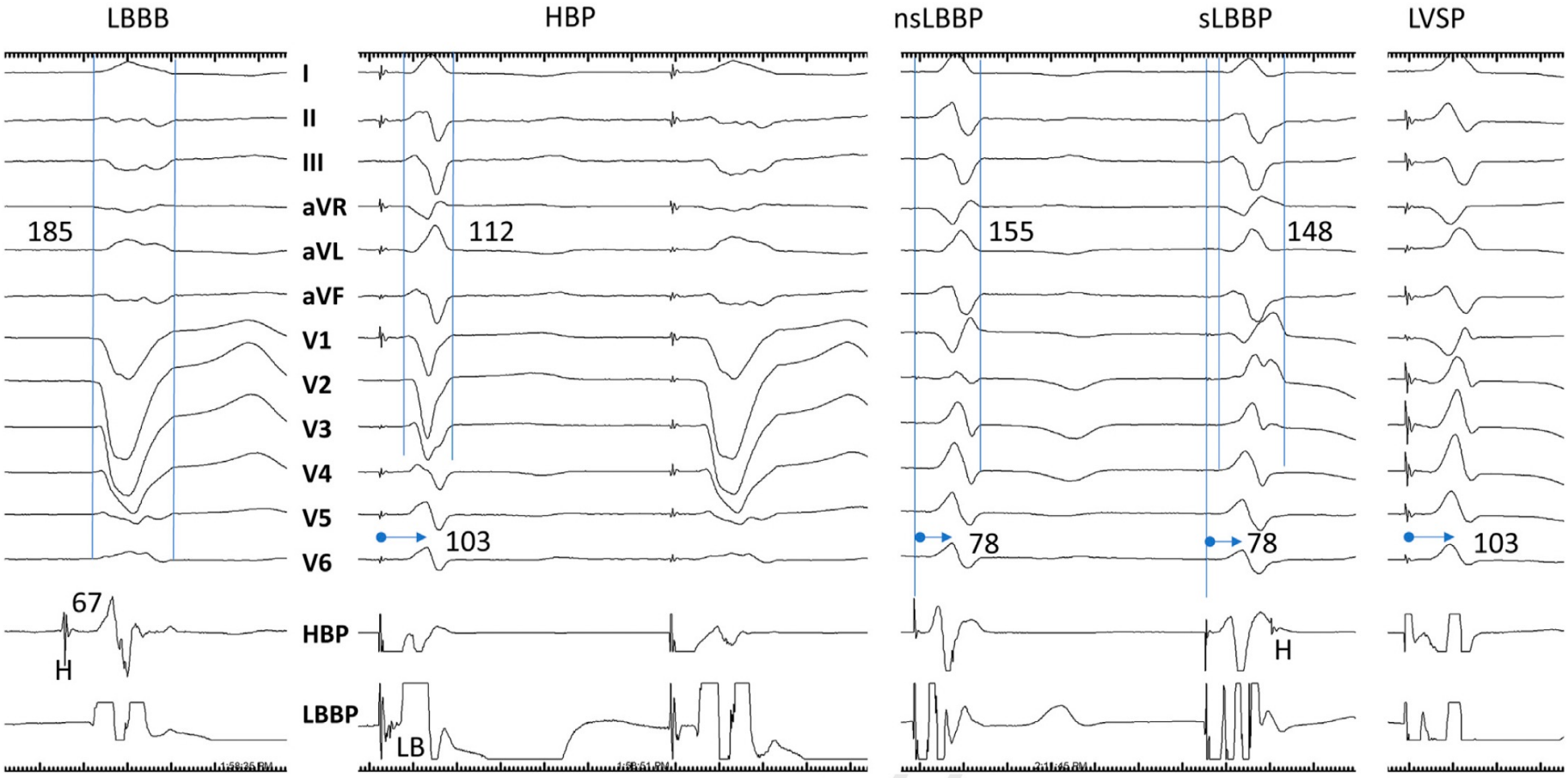
АНАТОМИЯ ВЕН СЕРДЦА И СРТ





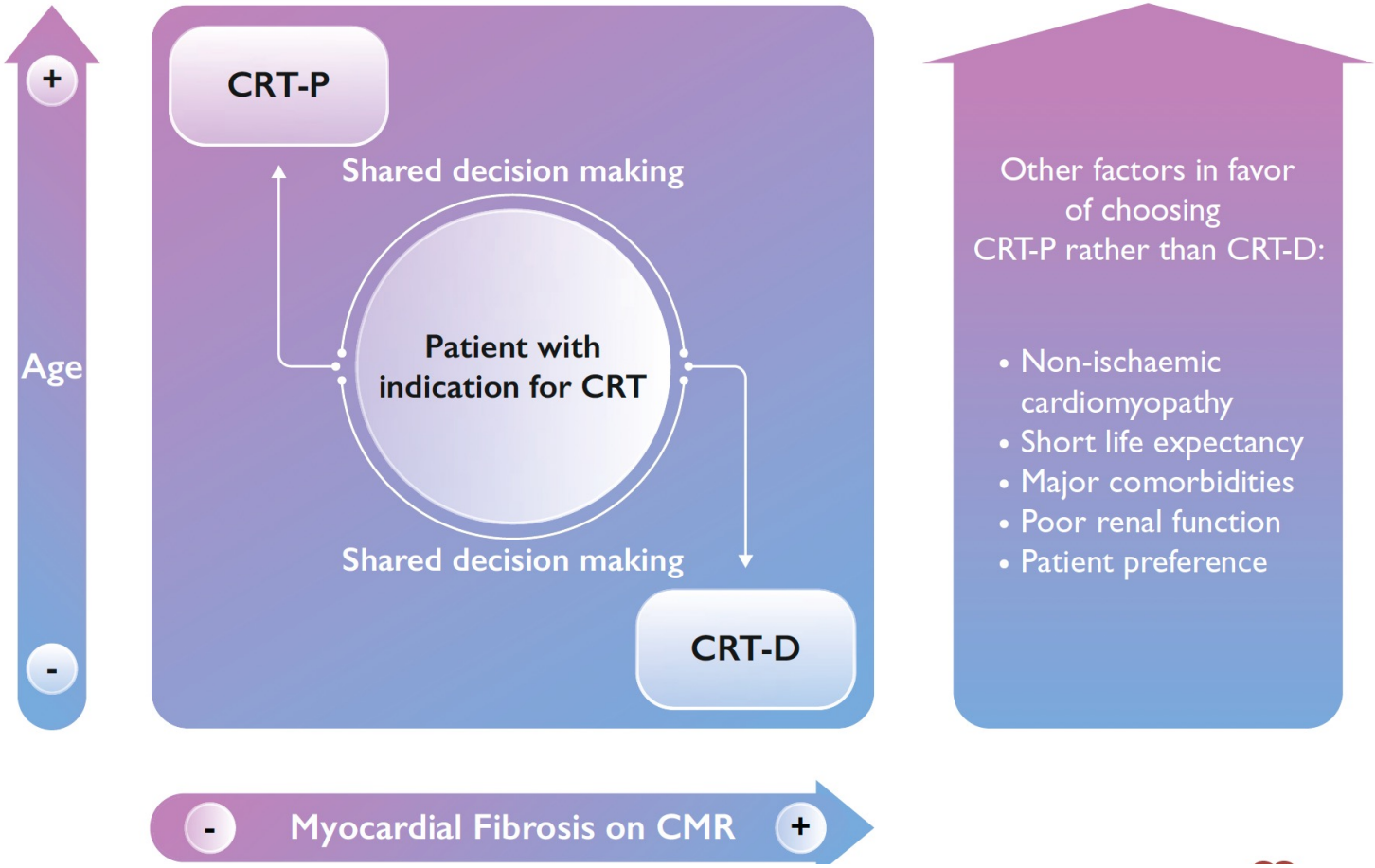
F.Kusumoto, M.Didenko. Understanding Intracardiac EGMs: Anatomic Correlates, in press

ЭКГ КРИТЕРИИ СТИМУЛЯЦИИ ЛНПГ



https://doi.org/10.1016/j.hrthm.2023.03.1538

CRT-P VS CRT-D



Eur Heart J. 2021;42(35):3427-3520.

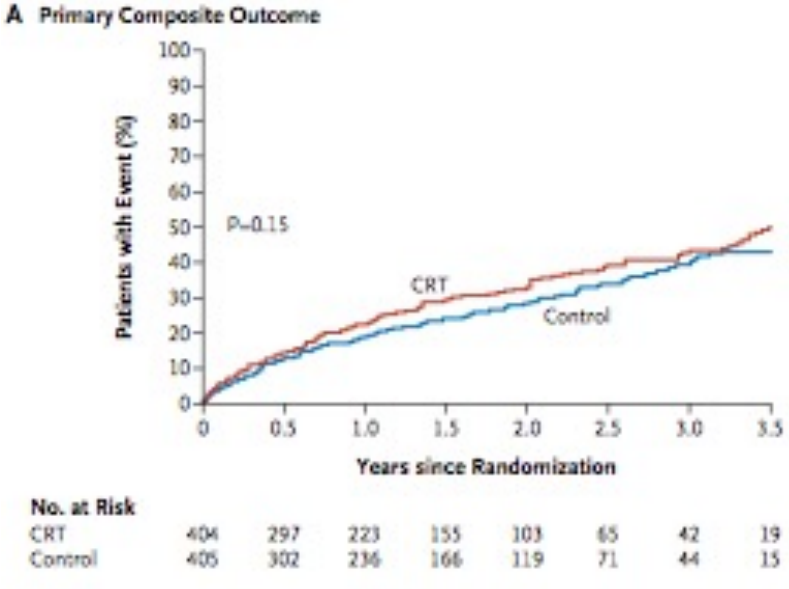
УЗКИЙ QRS? - ECHO-CRT

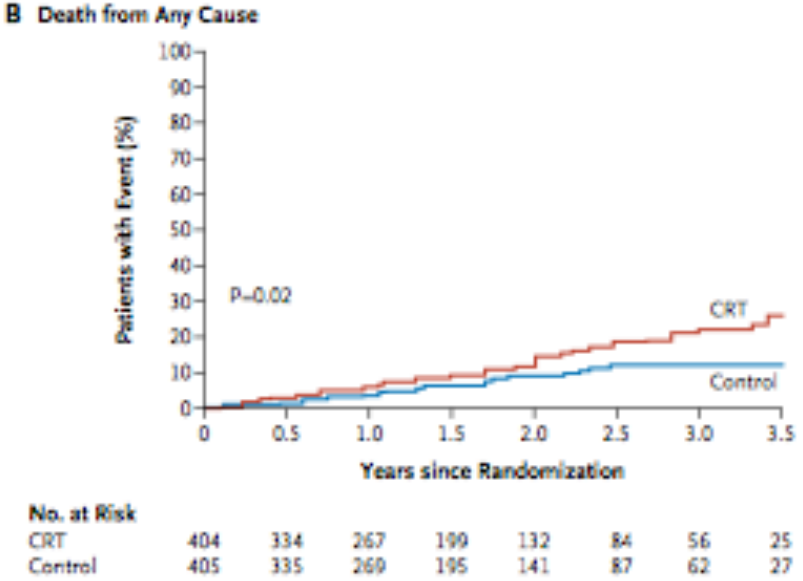
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 OCTOBER 10, 2013 VOL. 369 NO. 15

Cardiac-Resynchronization Therapy in Heart Failure with a Narrow QRS Complex

Frank Ruschitzka, M.D., William T. Abraham, M.D., Jagmeet P. Singh, M.D., Ph.D., Jeroen J. Bax, M.D., Ph.D., Jeffrey S. Borer, M.D., Josep Brugada, M.D., Ph.D., Kenneth Dickstein, M.D., Ph.D., Ian Ford, M.D., Ph.D., John Gorcsan III, M.D., Daniel Gras, M.D., Henry Krum, M.B., B.S., Ph.D., Peter Sogaard, M.D., D.M.Sc., and Johannes Holzmeister, M.D., for the EchoCRT Study Group*





BAROSTIM REBALANCES THE AUTONOMIC NERVOUS SYSTEM

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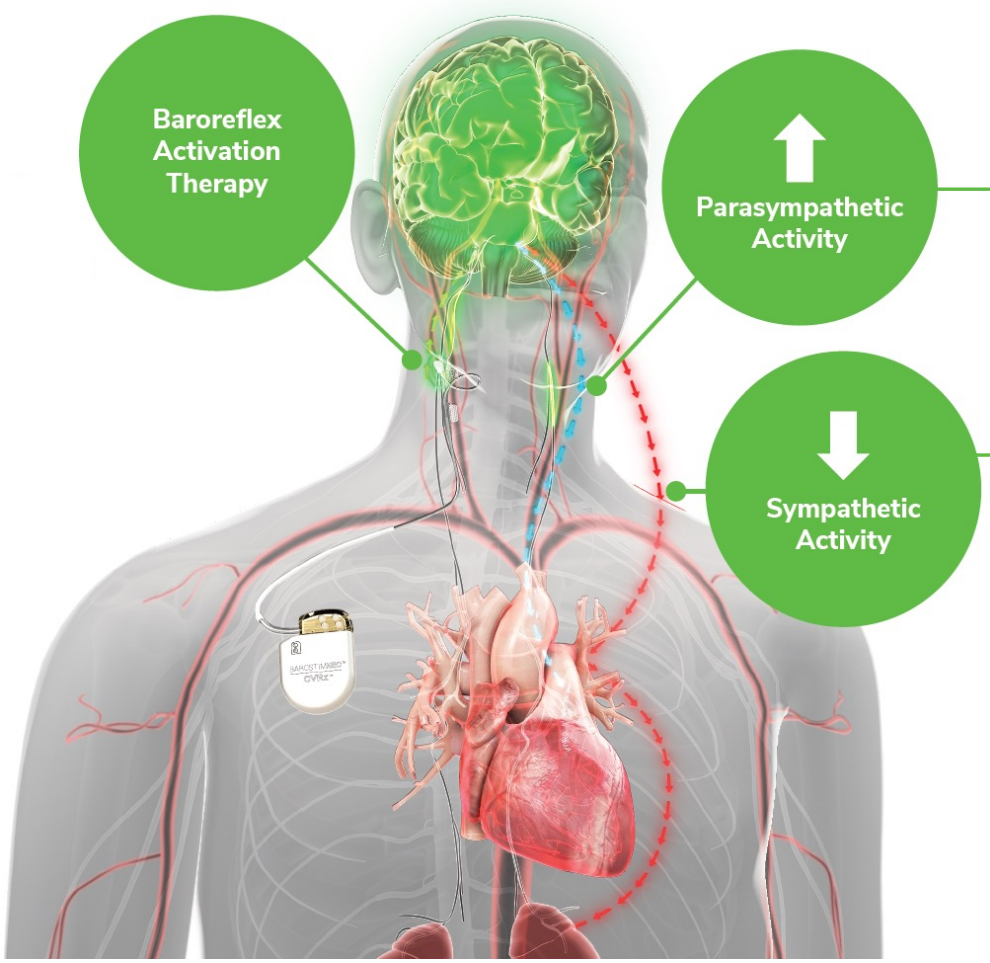

- Heart Rate ↓
- Positive Remodeling ↑
- Vasodilation ↑
- Blood Pressure ↓
- Diuresis ↑
- Renin Secretion ↓

CVRx® | BAROSTIM™

BEAT-HF SYMPTOM IMPROVEMENT

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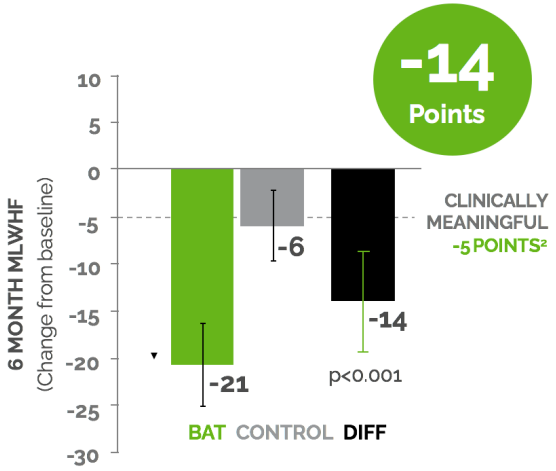
Quality of Life (MLWHF)

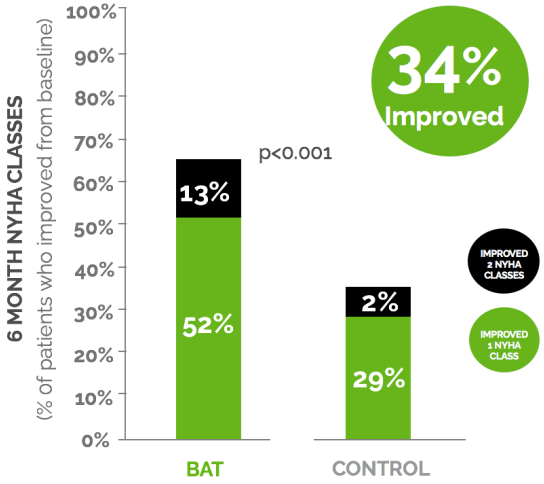


CRT Trial Results		
CONTAK CD[3]	NYHA III or IV LVEF≤35% QRS≥120ms	-11
MIRACLE[4]	NYHA III or IV LVEF≤35% QRS>130ms	-9

Exercise Capacity (6MHW)

CRT Trial Results		
CONTAK CD[3]	NYHA III or IV LVEF≤35% QRS≥120ms	39
MIRACLE[4]	NYHA III or IV LVEF≤35% QRS>130ms	29

NYHA Class



CRT Trial Results		
CONTAK CD[3]	NYHA III or IV LVEF≤35% QRS≥120ms	20%
MIRACLE[4]	NYHA III LVEF≤35% QRS≥130ms	30%

*Data from different studies and different patient populations may not be directly comparable

1. Zile MR, et al. *J Am Coll Cardiol 2020*; 76:1-13. 2. Rector TS, et al. *J Card Fail*. 1995;1(3):201-216. 3. Higgins SL, et al. *J Am Coll Cardiol* 2003;42:1454 –1459. 4. Abraham WT, et al. *N Engl J Med* 2002;346:1845–1853.
5. Gremeaux V, et al. *Arch Phys Med Rehabil.* 2011;92(4):611-619.

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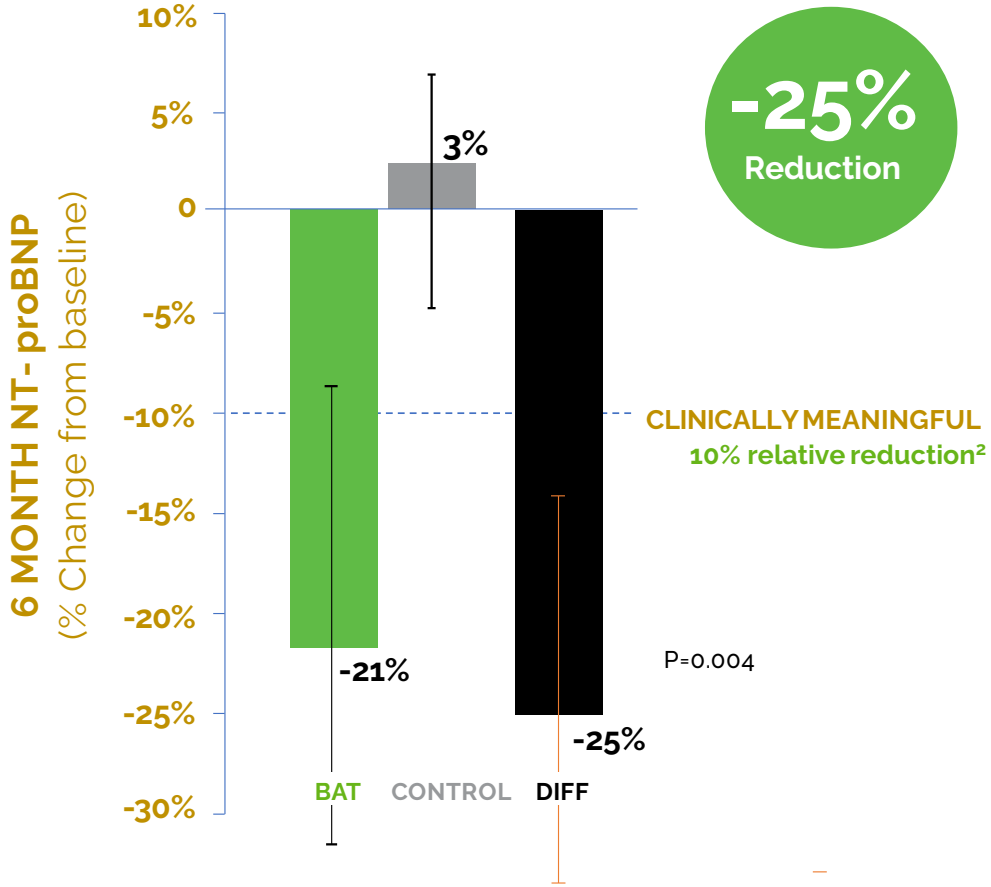
BEAT-HF NT-PROBNP REDUCTION[1]



PARADIGM-HF (ARNI) demonstrated that even a 10% reduction in NT-proBNP is associated with a significant benefit in terms of cardiovascular death or HF hospitalization[2]

BeAT-HF hospitalization and mortality data remains blinded to support on-going post-market phase

1. Zile MR, et al. *Am Coll Cardiol* 2020;76:1-13. 2. Zile MR, et al. *J Am Coll Cardiol.* 2016;68:2425-2436.

CVRx® | BAROSTIM™

CARDIAC CONTRACTILITY MODULATION

WHO

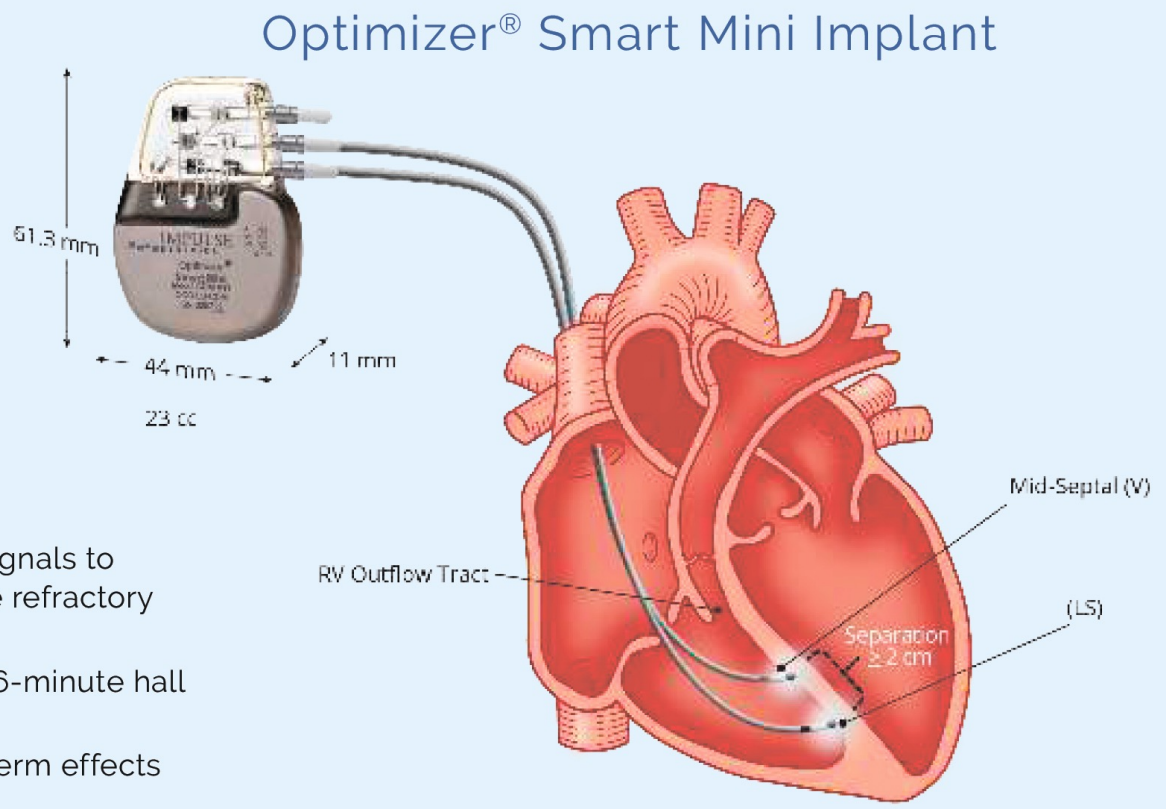
For patients with:

- LVEF 25–45%
- NYHA Class III
- Symptomatic despite guideline directed medical therapy
- Not indicated for Cardiac Resynchronization Therapy

WHAT

The Optimizer® Smart Mini delivers *CCM*® therapy, which:

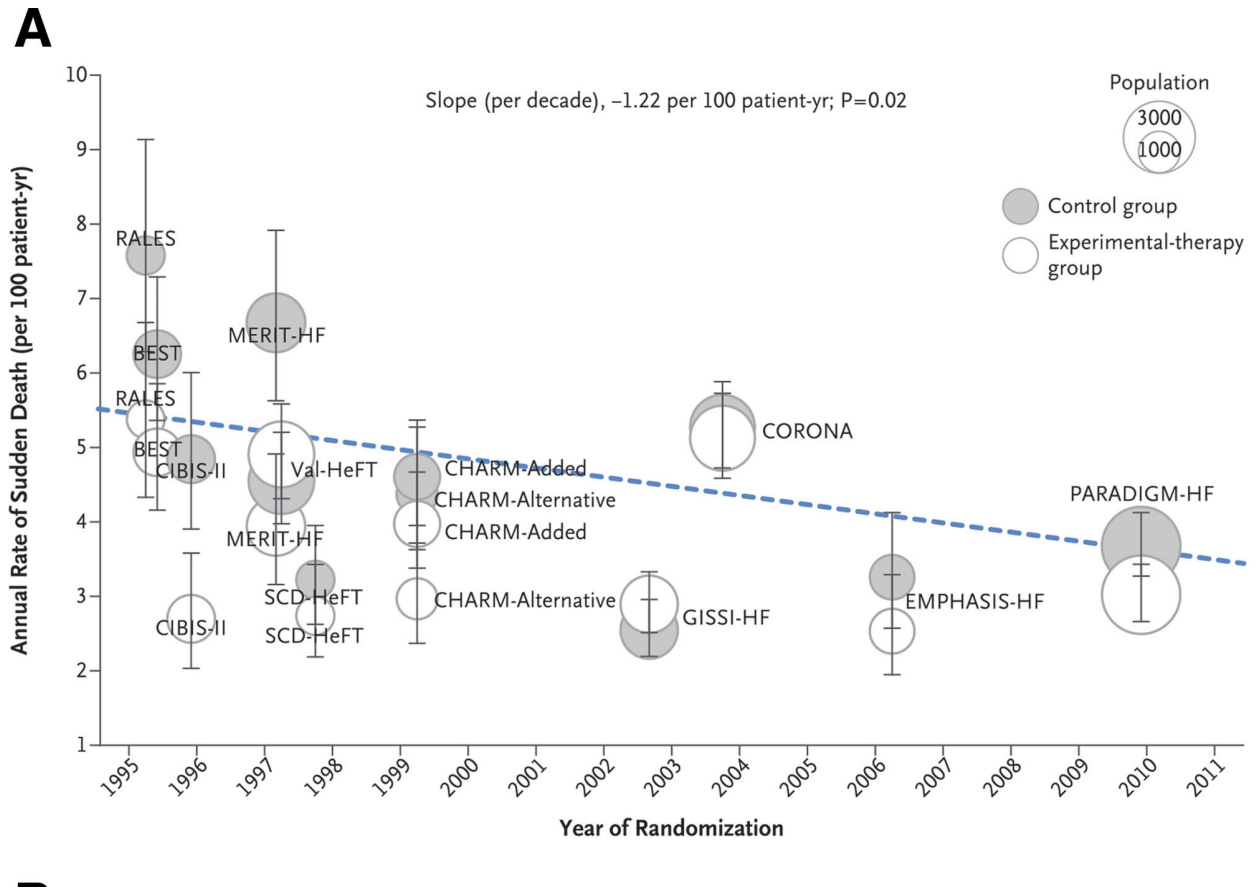
- Applies non-excitatory electrical signals to the RV septum during the absolute refractory period using standard leads
- Improves NYHA functional status, 6-minute hall walk distance and QoL status
- Has rapid, intermediate and long-term effects



***CCM*® is also known as Cardiac Contractility Modulation**

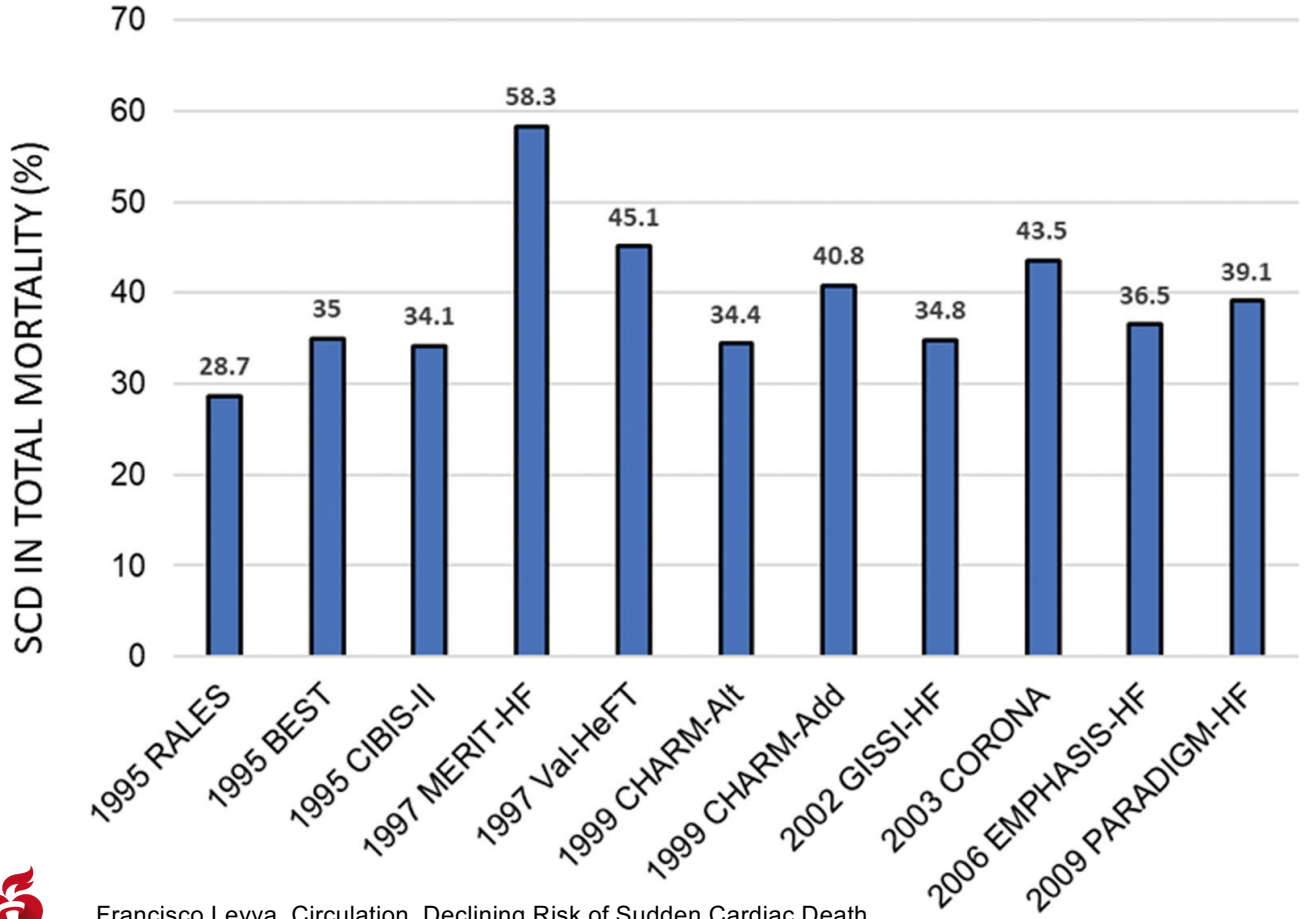
https://impulse-dynamics.com/

ВСС В ИССЛЕДОВАНИЯХ СН



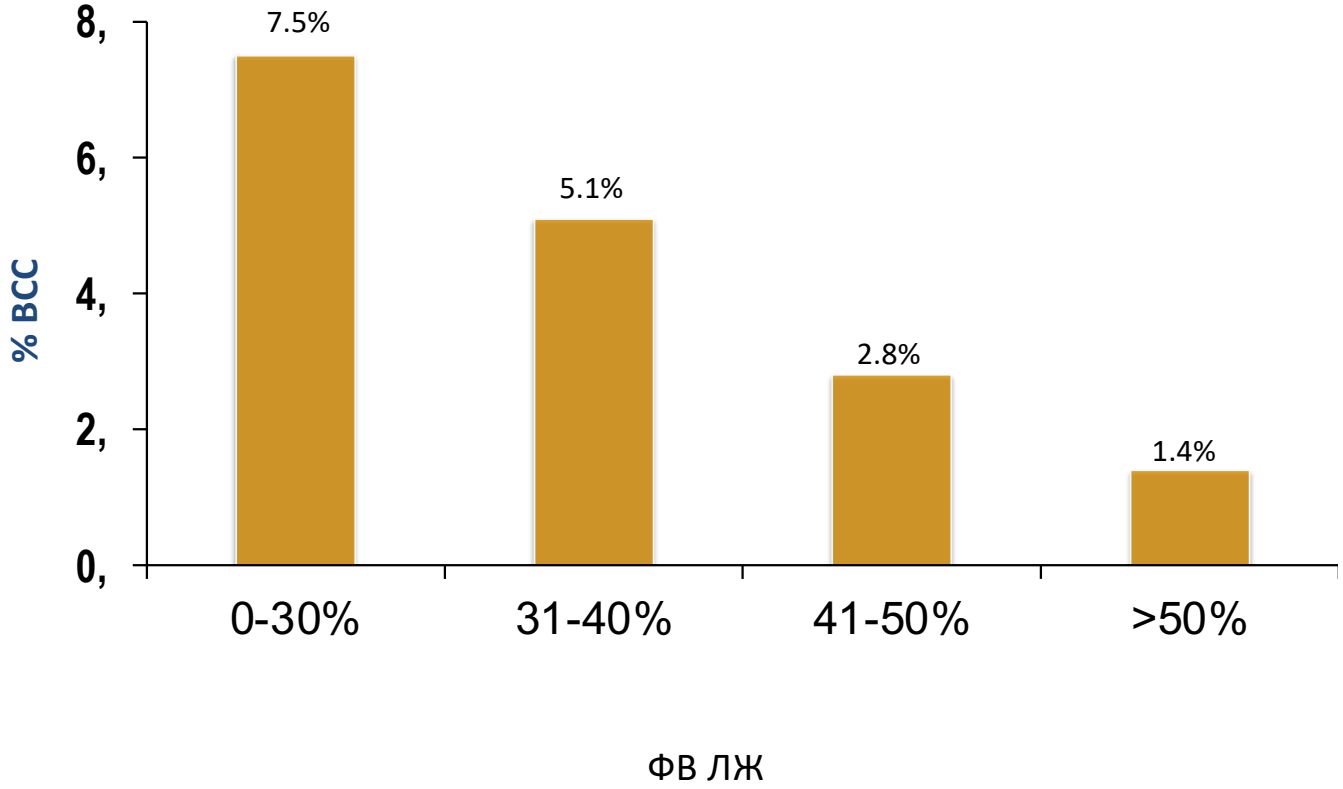
Francisco Leyva. Circulation. Declining Risk of Sudden Cardiac Death in Heart Failure: Fact or Myth?, Volume: 147, Issue: 9, Pages: 759-767, DOI: (10.1161/CIRCULATIONAHA.122.062159)

ДОЛЯ ВСС В ОБЩЕЙ СМЕРТНОСТИ У ПАЦИЕНТОВ С СН



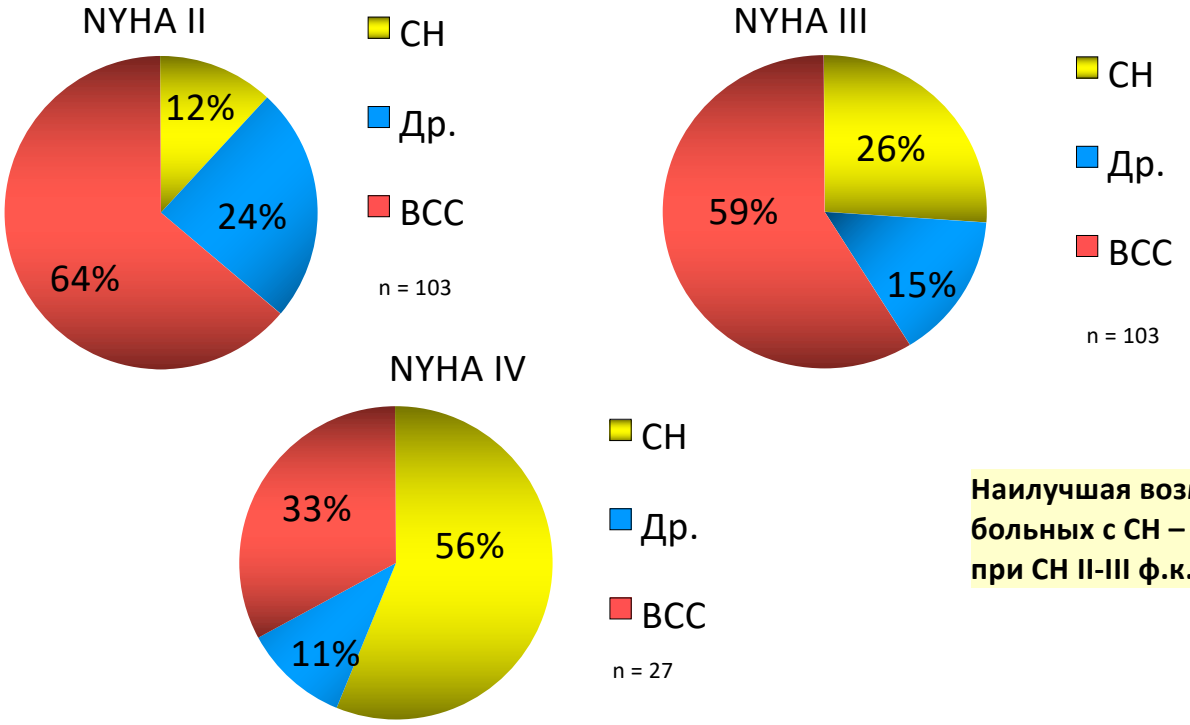
Francisco Leyva. Circulation. Declining Risk of Sudden Cardiac Death in Heart Failure: Fact or Myth?, Volume: 147, Issue: 9, Pages: 759-767, DOI: (10.1161/CIRCULATIONAHA.122.062159)

ФВ И % ВСС



Vreede-Swagemakers JJ. *J Am Coll Cardiol*. 1997;30:1500-1505.

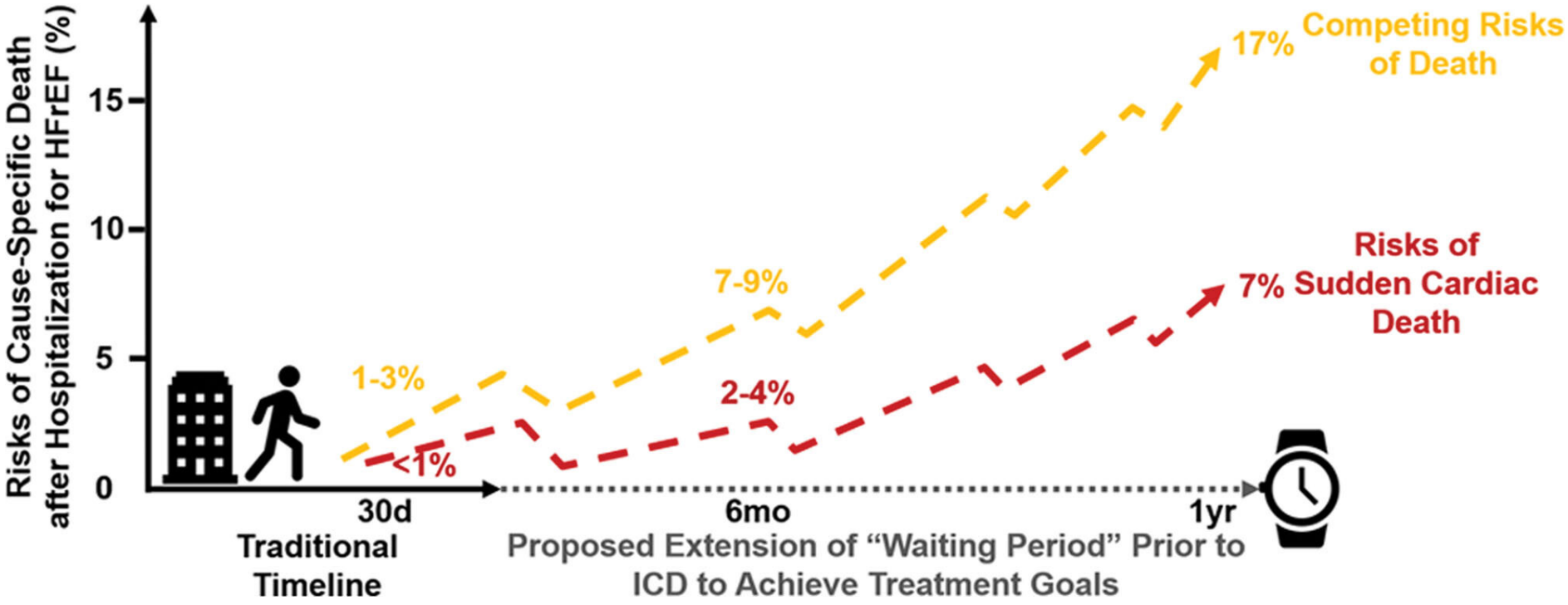
ВНЕЗАПНО УМИРАЮТ ЧАЩЕ ПАЦИЕНТЫ С СН II-III ФК



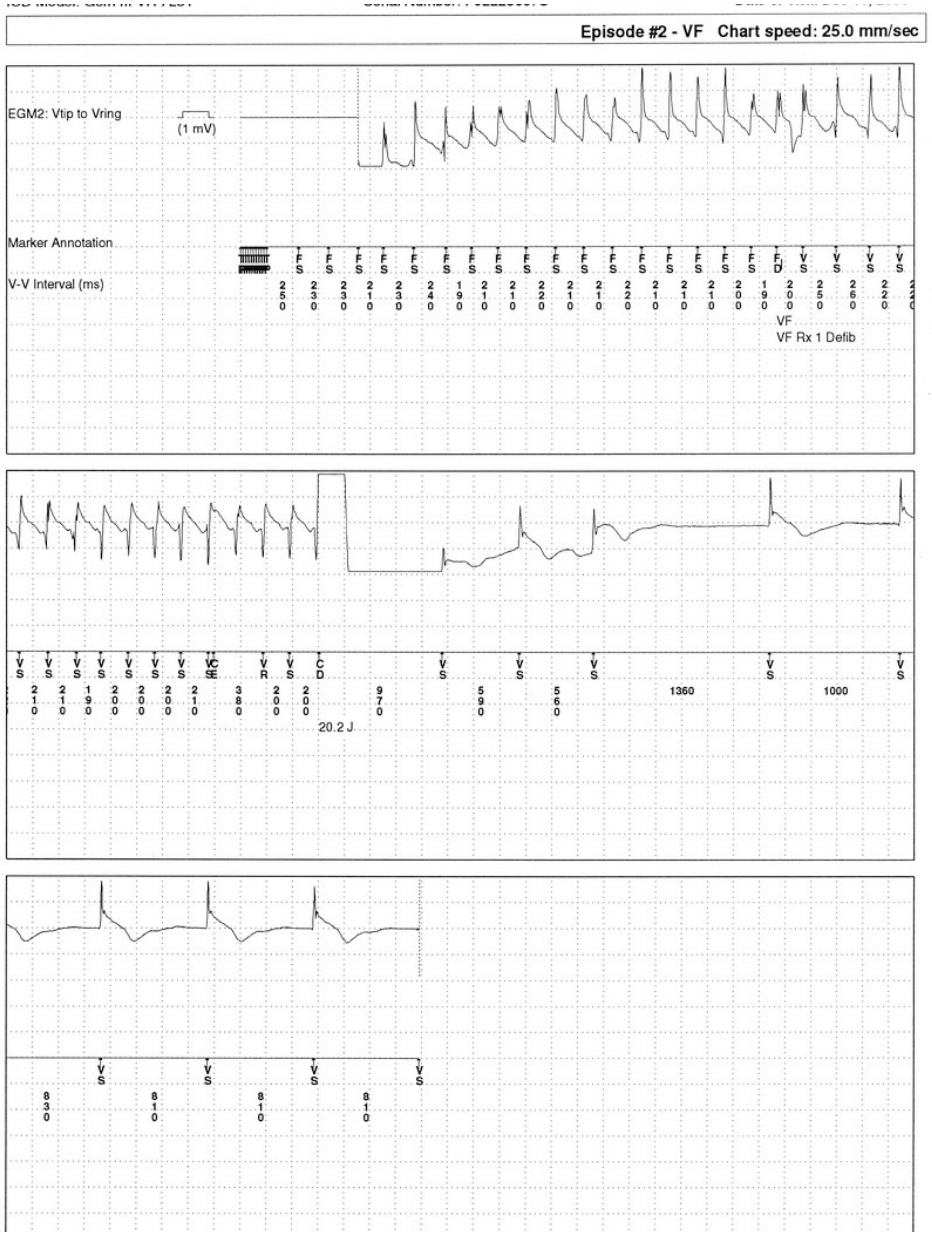
Наилучшая возможность спасти больных с СН – профилактика ВСС при СН II-III ф.к.

MERIT-HF Study Group. Effect of Metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL randomized intervention trial in congestive heart failure (MERIT-HF). *LANCET*. 1999;353:2001-07.

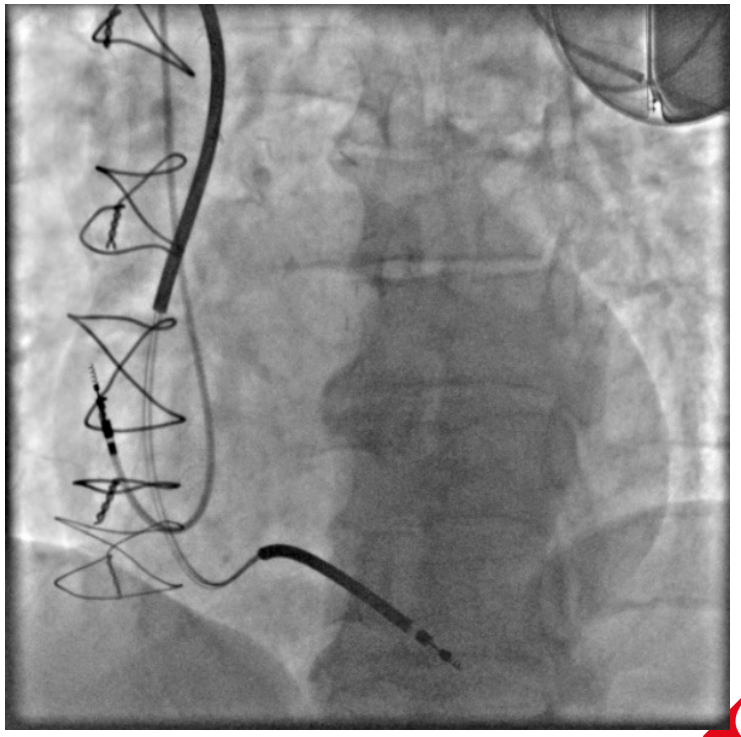
ЭФФЕКТ ПЕРИОДА ОЖИДАНИЯ ИМПЛАНТАЦИИ ИКД НА РИСК ВСС



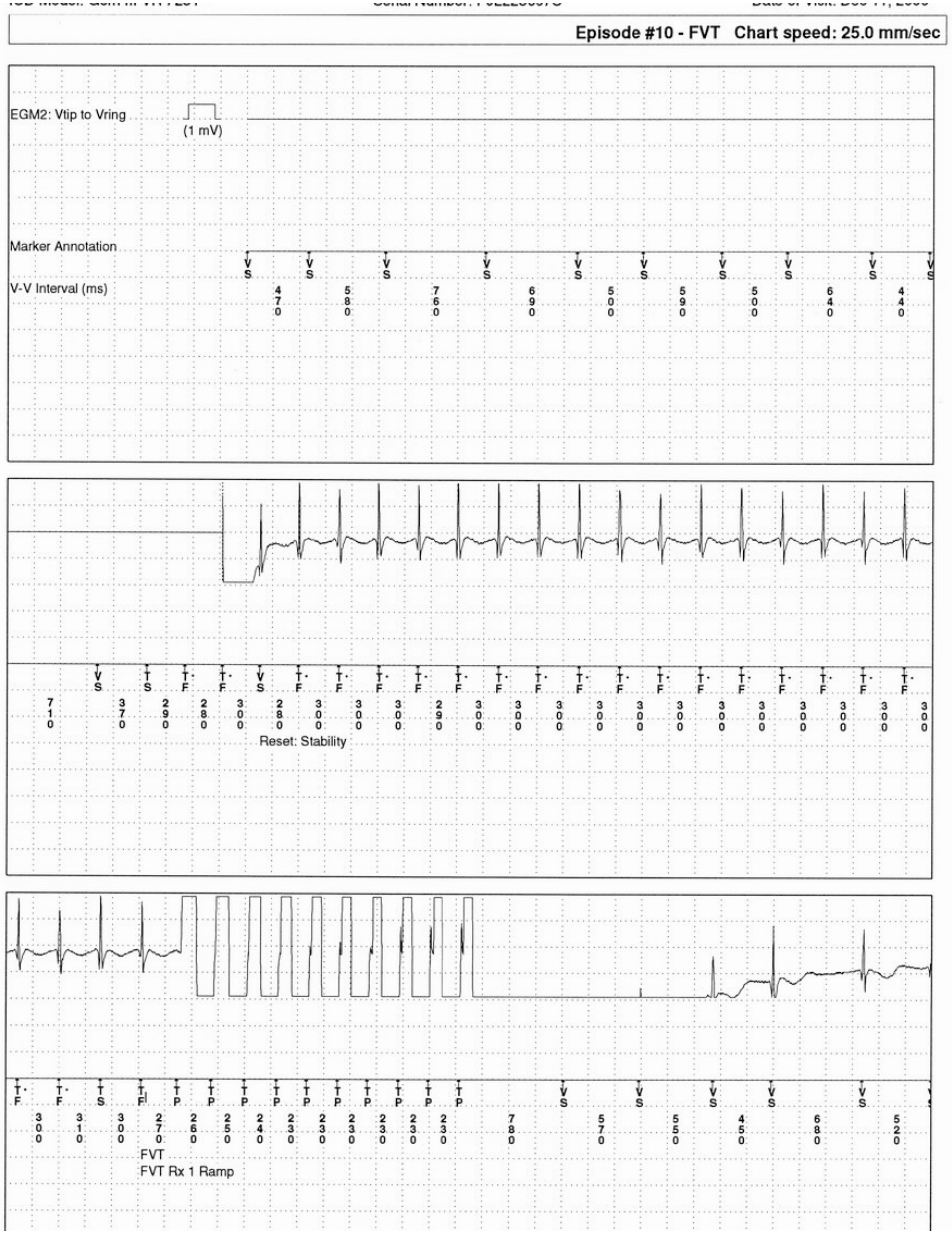
Francisco Leyva. Circulation. Declining Risk of Sudden Cardiac Death in Heart Failure: Fact or Myth?, Volume: 147, Issue: 9, Pages: 759-767, DOI: (10.1161/CIRCULATIONAHA.122.062159)

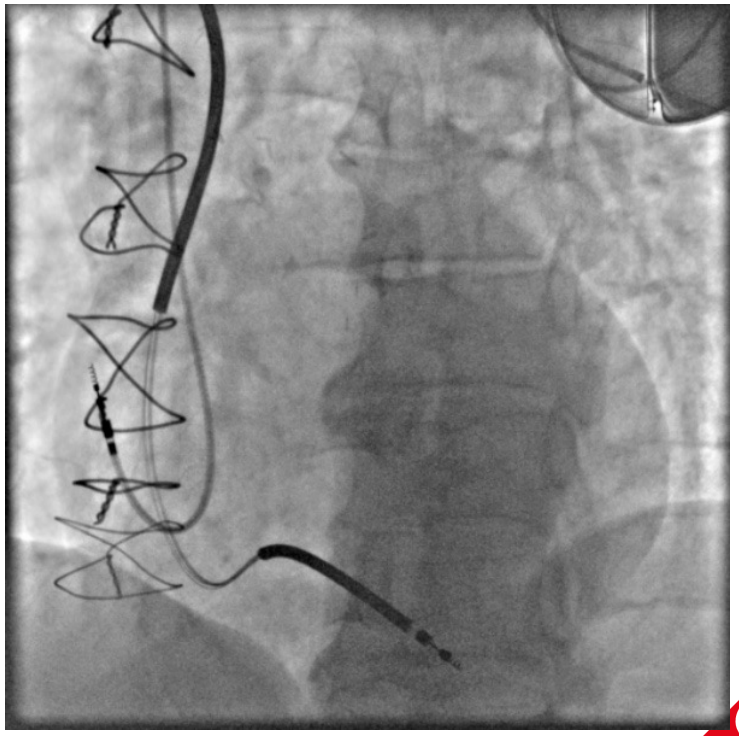


КУПИРОВАНИЕ ЭПИЗОДА ФЖ КАРДИОВЕРСИЕЙ (ШОК)

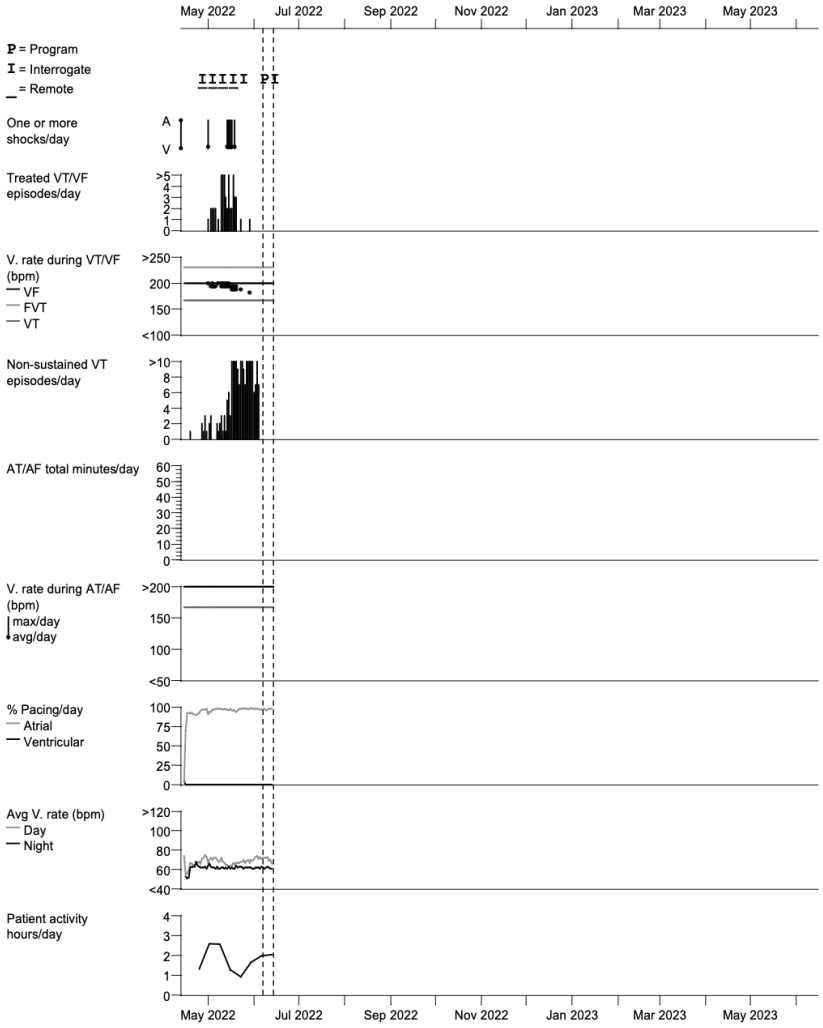


КУПИРОВАНИЕ ЭПИЗОДА ЖТ АНТИТАХИ СТИМУЛЯЦИЕЙ (RAMP)



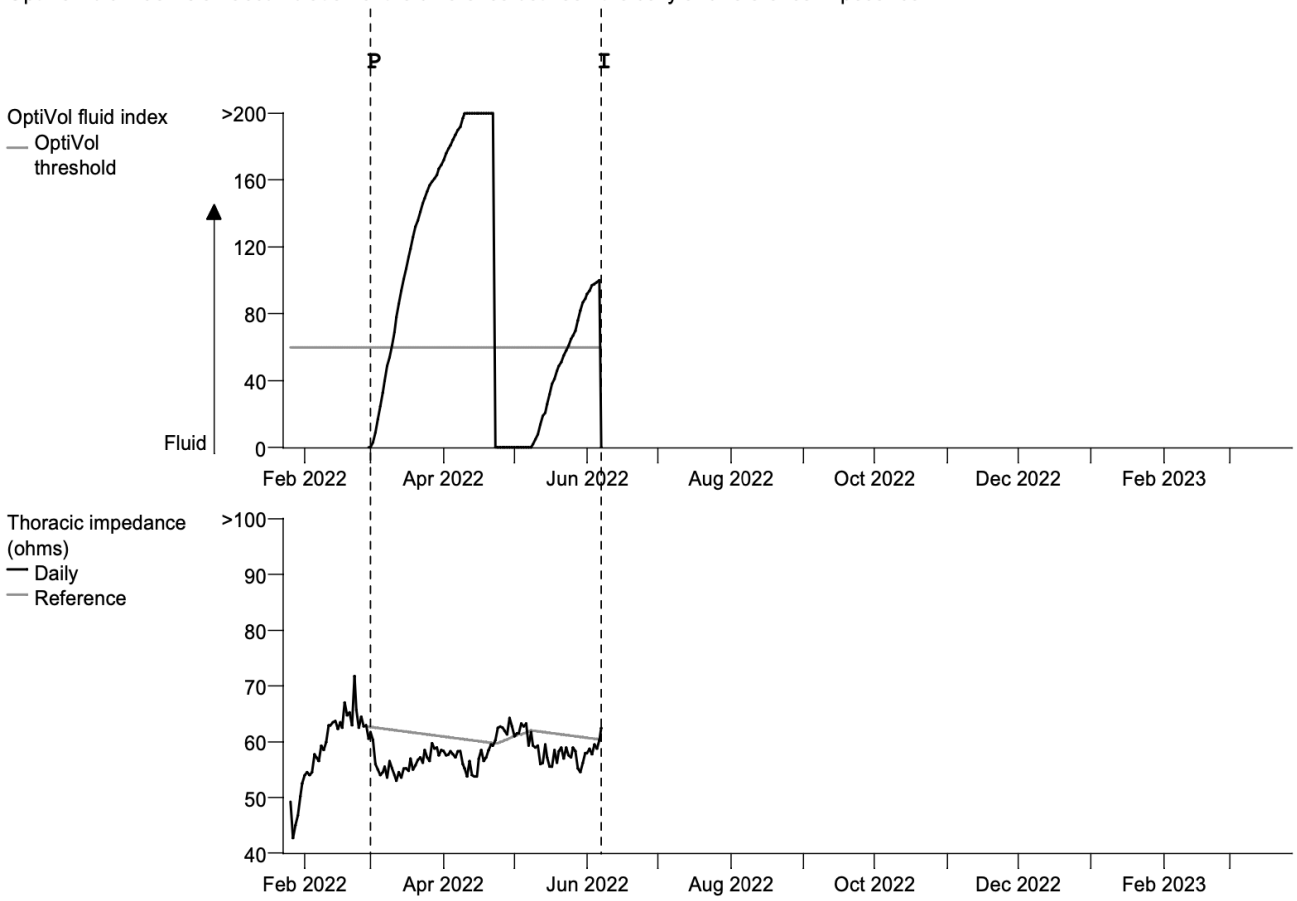


CARDIAC COMPASS REPORT



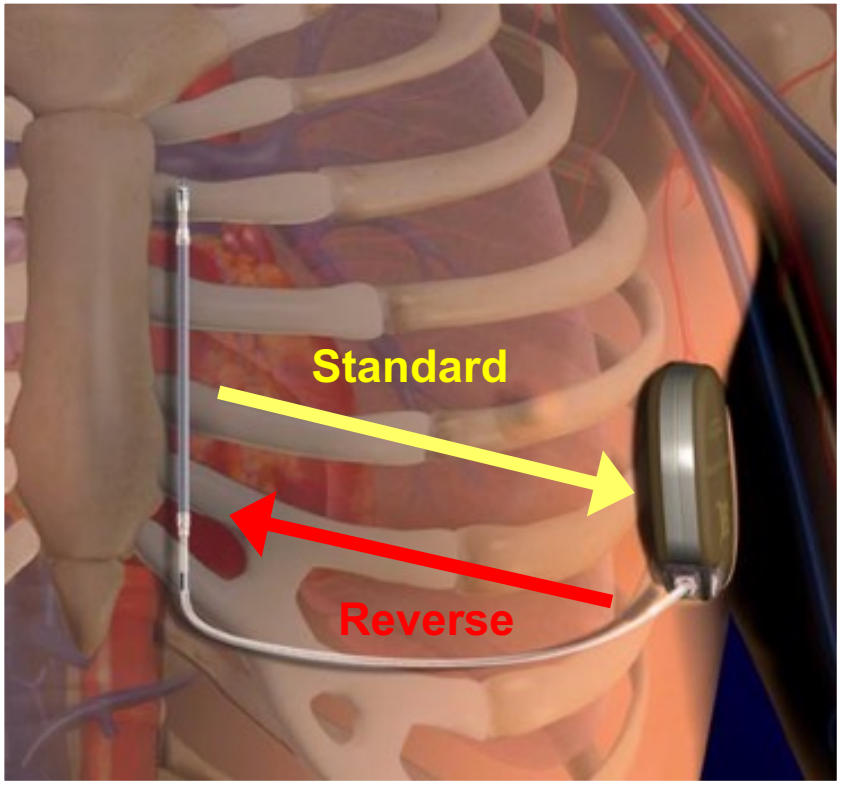
CARDIAC COMPASS REPORT

OptiVol fluid index is an accumulation of the difference between the daily and reference impedance.

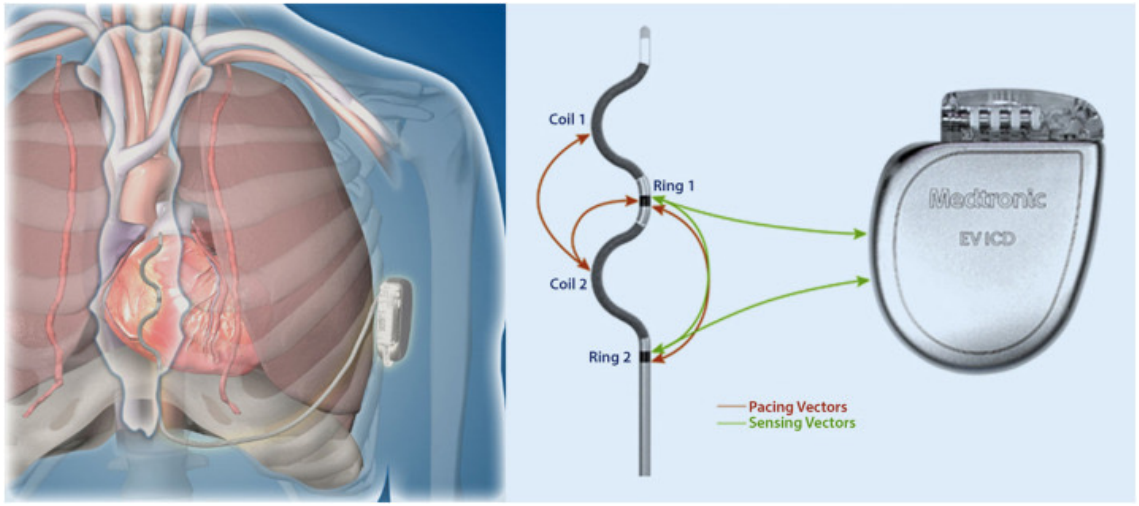


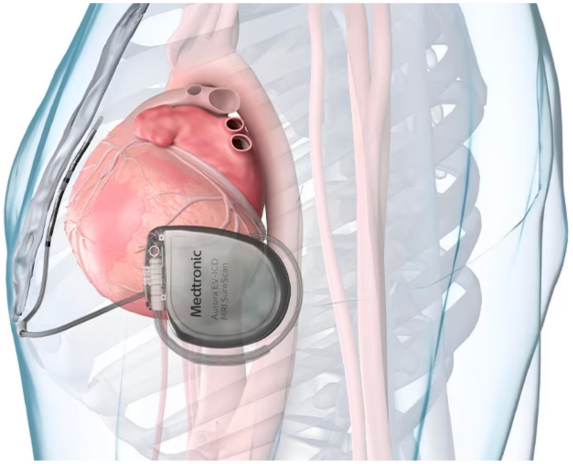
Носимый

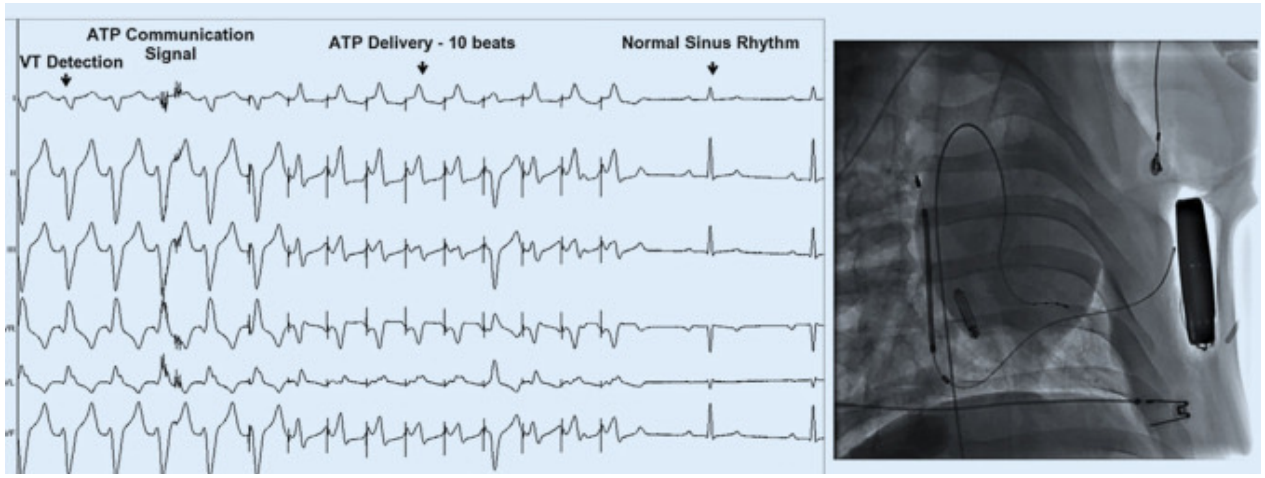
Подкожный



EXTRAVASCULAR ICD







ПРОФИЛАКТИКА ВСС

ESC European Society of Cardiology

European Heart Journal (2022) **43**, 3997–4126
https://doi.org/10.1093/eurheartj/ehac262

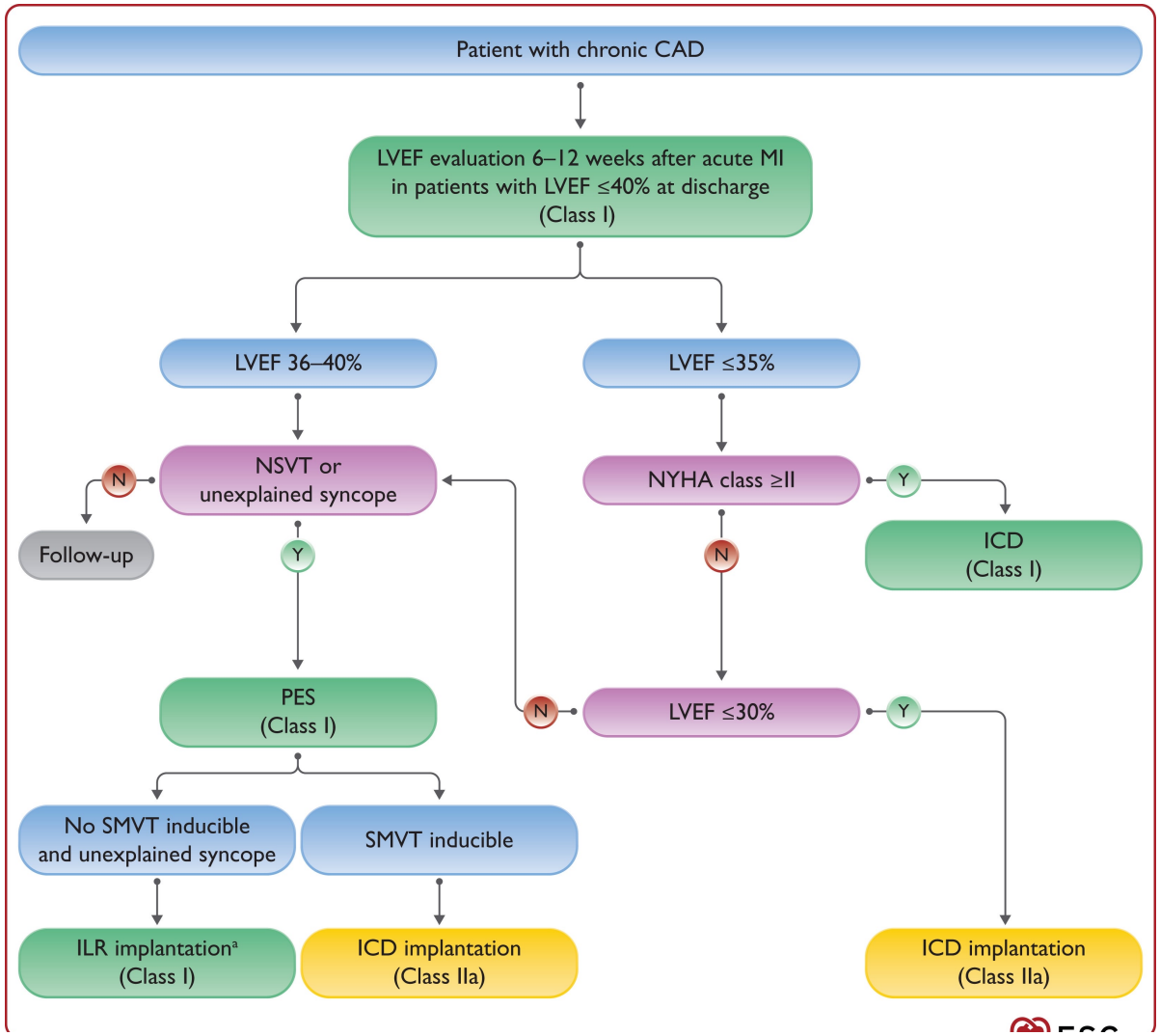
ESC GUIDELINES

2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

General aspects

Optimal medical treatment including ACE-I/ARB/ARNIs, MRAs, beta-blockers, and SGLT2 inhibitors is indicated in all heart failure patients with reduced EF.	I

ПРОФИЛАКТИКА ВСС У ПАЦИЕНТОВ С ИШЕМИЧЕСКОЙ СН



European Heart Journal (2022) 43, 3997–4126

ПРОФИЛАКТИКА ВСС У ПАЦИЕНТОВ С КМП

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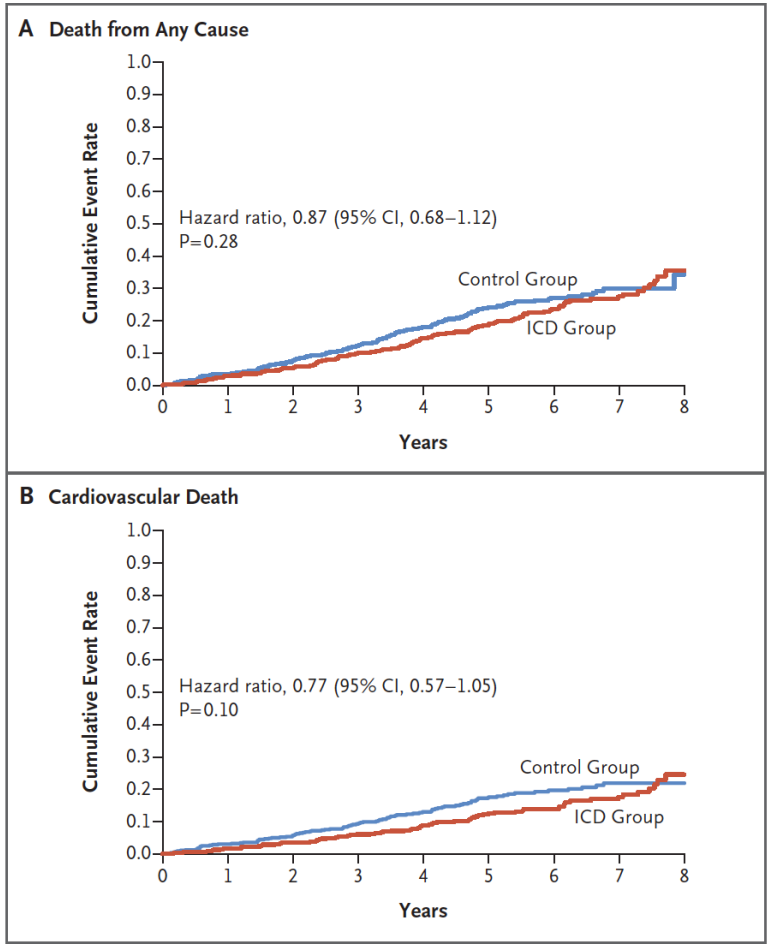
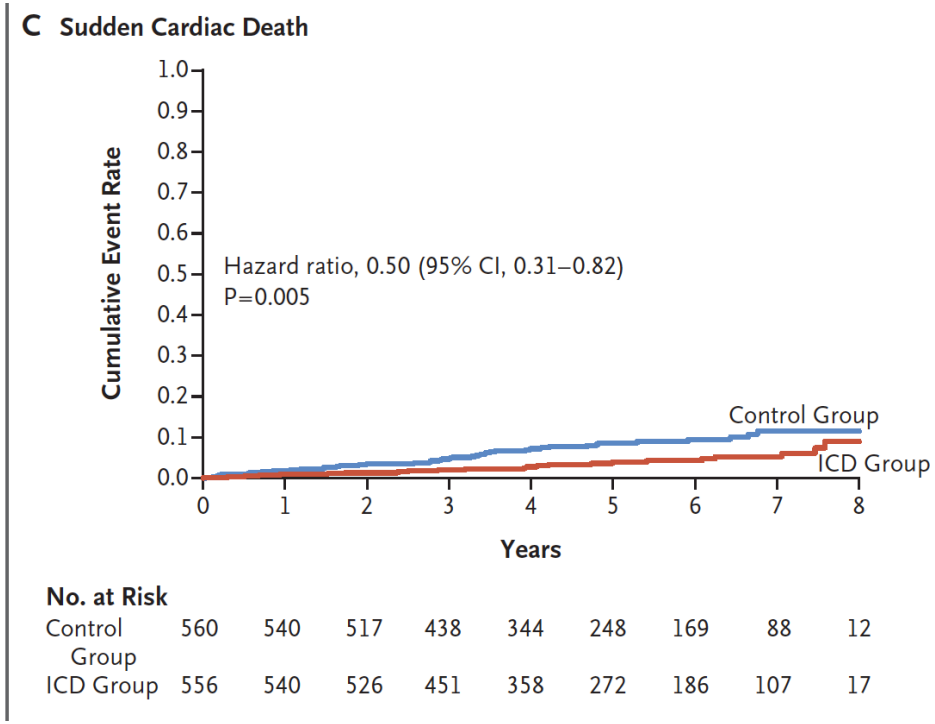
DCM/HNDCM

ICD implantation should be considered in DCM/HNDCM patients with an LVEF <50% and ≥2 risk factors (syncope, LGE on CMR, inducible SMVT at PES, pathogenic mutations in LMNA, *PLN*, *FLNC*, and *RBM20* genes).		**IIa**
ICD implantation should be considered in patients with DCM/HNDCM and haemodynamically tolerated SMVT.		**IIa**
ICD implantation should be considered in patients with DCM/HNDCM, symptomatic heart failure (NYHA class II–III) and LVEF ≤35% after ≥3 months of OMT.	**I**	**IIa**

European Heart Journal (2022) 43, 3997–4126

DANISH – TRIAL
ПАЦИЕНТЫ С ДИЛЯТАЦИОННОЙ КМП (N=1116)



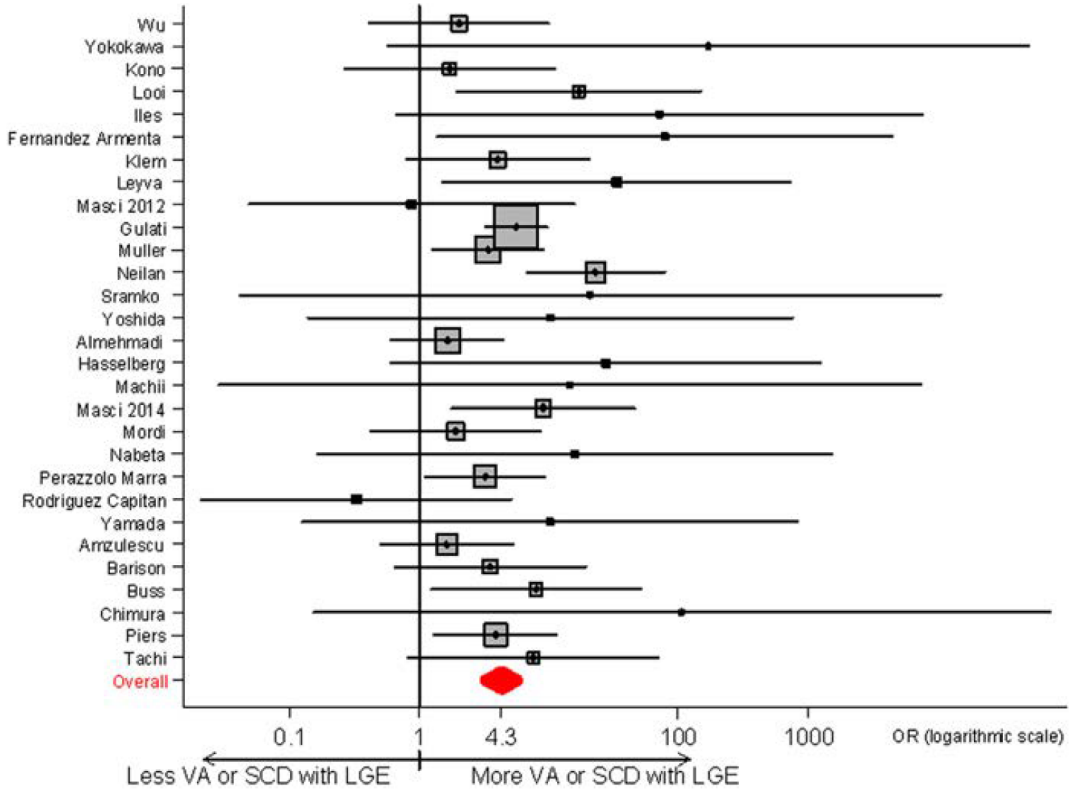


No. at Risk

Control Group	560	540	517	438	344	248	169	88	12
ICD Group	556	540	526	451	358	272	186	107	17

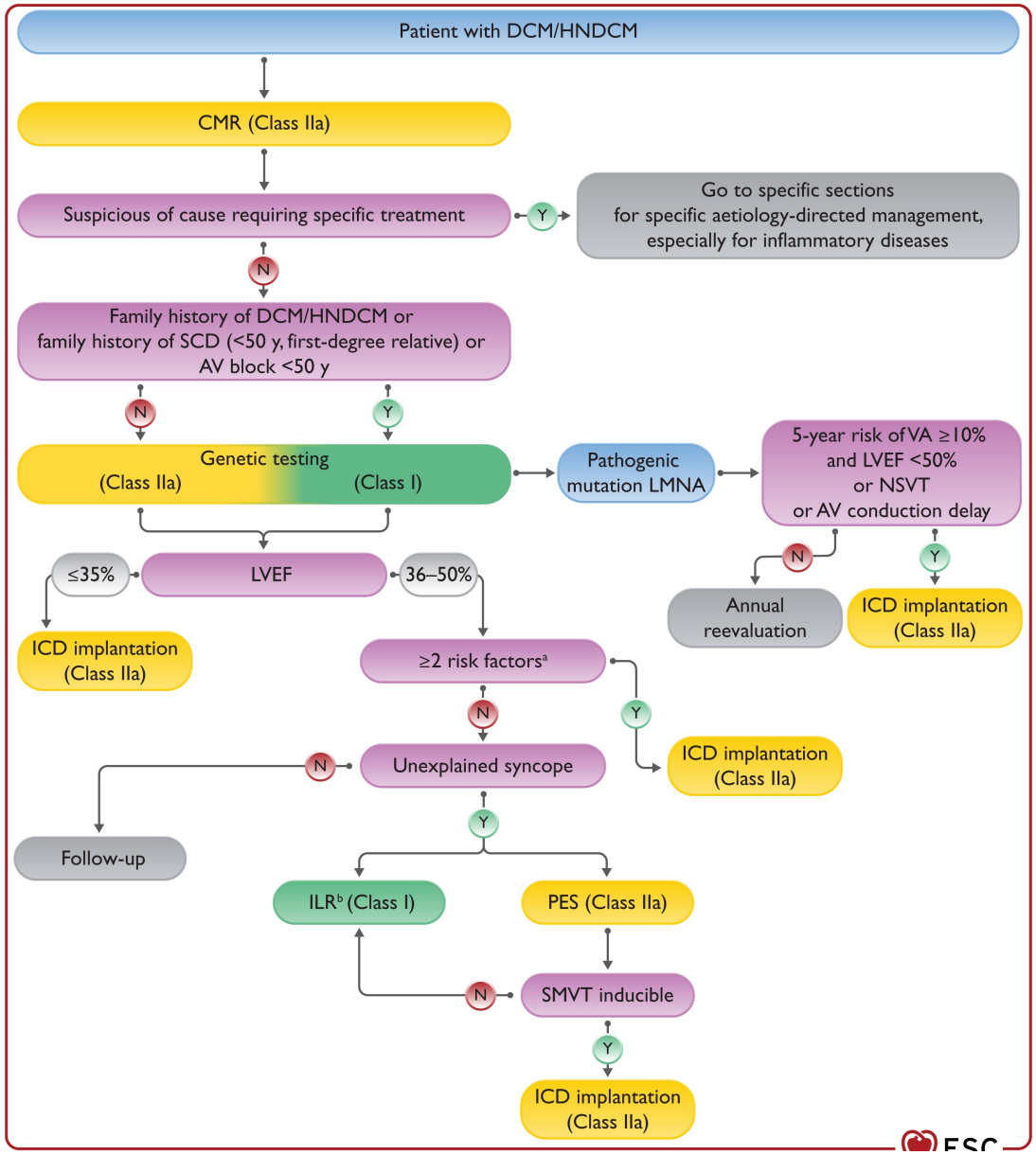
N Engl J Med 2016;375:1221-30.

РУБЦОВЫЕ ЗОНЫ НА МРТ – ПРЕДИКТОР ЖА И ВСС



LGE = late gadolinium enhancement; OR = odds ratio; SCD = sudden cardiac death; VA = ventricular arrhythmias.

JACC:HEART FAILURE VOL.5,NO.1,2017



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DCM/HNDCM

ПРОФИЛАКТИКА ВСС У ПАЦИЕНТОВ С СН ПОСЛЕ ПЕРЕНЕСЕННОГО МИОКАРДИТА

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Inflammatory diseases

In patients with cardiac sarcoidosis who have an LVEF >35% but significant LGE at CMR after resolution of acute inflammation, ICD implantation should be considered.	**IIa**
In patients with cardiac sarcoidosis who have an LVEF 35–50% and minor LGE at CMR, after resolution of acute inflammation, PES for risk stratification should be considered.	**IIa**
In patients with cardiac sarcoidosis, LVEF 35–50%, and inducible SMVT at PES, ICD implantation should be considered.	**IIa**

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ПРОФИЛАКТИКА ВСС У ПАЦИЕНТОВ С СН ПОСЛЕ ПЕРЕНЕСЕННОГО МИОКАРДИТА

Inflammatory diseases

In patients with haemodynamically not-tolerated SMVT occurring in the chronic phase of myocarditis, ICD implantation is recommended.	IIa	I
ICD implantation is recommended in patients with cardiac sarcoidosis who have an LVEF ≤35%.	IIb	I
ICD implantation is recommended in patients with cardiac sarcoidosis who (1) have documented sustained VT, or (2) aborted CA.	IIb	I

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ЗАКЛЮЧЕНИЕ

1. КРТ для хронической сердечной недостаточности (ХСН) является эффективным методом лечения ХСН, уменьшает проявления СН, снижает общую смертность у пациентов с ХСН и может быть рекомендован пациентам с симптоматической ХСН, ФВ < 35%, СН (I-IV) ф.к., при БЛНПГ с шириной комплекса QRS > 130 мс, а при других блокадах с шириной комплекса QRS > 150 мс.
2. Индивидуализация работы КРТ с целью достижения максимальной эффективности лечения, и оптимизация лекарственной терапии, включая все современные группы препаратов, является важнейшим компонентом лечения пациентов с ХСН и имплантированными устройствами.
3. Стимуляция ЛНПГ является одним из альтернативных методов коррекции электрической диссинхронии при БЛНПГ, особенно в случаях неуспешной имплантации левожелудочкового электрода.
4. Баростимуляция (Barostim), активирующая барорефлекс, и ССМ терапия могут быть рассмотрены как альтернативный подход для пациентов с ХСН и неполным блоком левой ножки пучка Гиса, которые не подходят для стандартной КРТ.
5. Имплантация ИКД эффективный способ для первичной профилактики внезапной сердечной смерти у пациентов с ХСН как ишемической, так и неишемической природы (ФВ <35%) в том числе на фоне современной фармакологической терапии, (включая Юперио) и снижает общую смертность на 27 %.

Спасибо большое за внимание!

Heart and Diabetes Center NRW

University Clinic of the Ruhr University Bochum (Bad Oeynhausen)

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